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AUTOMOTIVE INDUSTRIES

THE AUTOMOBILE

VOL. XLI

NEW YORK—THURSDAY, OCTOBER 16, 1919—CHICAGO

No. 16

Paris Show Indicates Trend Toward American Practice

First International Exhibition Since 1913 Is Representative of European Makers—Among Changes That Have Gained Are the Use of Taper Bearings, Detachable Cylinder Heads, Aluminum Pistons, Pressed Steel Axles, Unit Power Plants, Battery Ignition and Electric Lighting and Starting, and More Six, Eight and 12 Cylinder Engines Are Employed—French Makers Strive to Hold Position in High Class Work—"Popular" Car Priced at \$2,500 at Normal Exchange

By W. F. Bradley

Paris, Oct. 9.

THE result of six years' war experience is embodied in the exhibits of 120 car manufacturers in the Paris Automobile Show which opened here today. So important does France consider the automobile industry that President Poincaré, attended by leading members of the government, officially opened the show in the finest building in the world for such an exposition, the Grand Palais, France's \$5,000,000 show house.

This being the first automobile show in Europe since 1913, the interest is unbounded. The total of 800 exhibitors indicates the magnitude of the show and the interest of the people. The exhibits alone are estimated to have a value of \$3,000,000.

The show is strongly international in character. All of the French manufacturers are on hand. All of the Italian manufacturers are exhibiting. One-half of the

Belgian manufacturers and eight from England are here, while the exhibit of American cars is greater than ever before.

The show is a general exhibit of Europe's post-war production and is the most interesting technical exhibition ever held on this continent. It has been difficult for most of the manufacturers to have their chassis completed in time, and it is certain that the manufacturers are not ready to go into immediate production on the new models.

Prices are not definitely settled by several of the manufacturers. Renault, for example, has informed his agents that they are not to guarantee that prices will remain unchanged until cars are delivered.

The exhibit gives the impression that European automobile manufacturers who always have aimed at high

class work today appear to be anxious to show that they are capable of producing the best cars in the world. Consequently prices are high and there are many beautiful chassis selling as high as 45,000 francs without body. This would indicate that the high priced field is being given too much attention and that the high priced market will soon be saturated, due to the contemplated quantity production.

The European light car has not been neglected and, while production has not gotten under way as was expected, large preparations are in progress. There are two distinct classes of European light cars:

Class 1—This has a very small engine and has cramped accommodation for four passengers. Citroen is a leader in this class and his car is unchanged since first produced and exhibited at the Lyon Fair last March. At that time he hoped soon to attain a production of 100 per day, but output now is approximately 40 per day. Peugeot is working along similar lines for a light car.

Renault has entered the cheap car field with a machine having a characteristic Renault engine and with a rear construction closely resembling Ford. This car has a two-speed gearbox mounted forward and carrying the front end of the torque tube. It was originally announced to sell at 8,600 francs complete, but the price has been increased to 12,000 francs.

Class 2—This is an American type car with a comparatively large engine, a three-speed gearbox, which is generally a unit with the engine, and accommodations for five passengers.

Bellanger has brought out a cheap car, in the design of which Benjamin Briscoe has co-operated. The job is entirely along American lines and is listed at 18,000 francs.

Lorraine-Dietrich has a medium priced car of simple design which it is believed will sell complete at less than 12,000 francs. This car has a 6-cylinder valve-in-the-head engine and three-speed gearbox. It is the design of Engineer Barbarou, formerly engineer for the Delaunay Belleville.

Berliet is working on a car of American lines which was exhibited at the Lyons Fair last spring.

Suere is a new concern which has produced practically one of the smallest 8-cylinder engines in the world. The cylinders are 45x90 mm. or 1.7x3.5 in. bore and stroke. The chassis carries a two or three-passenger body. It is a good production job.

The question of number of cylinders has struck Europe and the four, sixes, eights and twelves are all in the show. The number of four-cylinder types has increased and greatly predominate.

Six-cylinder types are more prominent than before. Some of those exhibited are Fiat, Delage, Lorraine-Dietrich, Brasier, Delahaye, Delaunay Belleville, Farman, Gnome, Hispano-Suiza, Minerva, Peugeot, Renault, Rochet Schneider, Wolseley, Daimler and Sunbeam. The last three are British machines.

It was known last January that Darracq would bring out an 8-cylinder car, and that De Dion Bouton, the pioneer of 8-cylinder construction, would also continue with eights. These are on exhibition. Other 8-cylinder types are Bellanger and the Suere with its miniature cylinders of 1.7 in. bore.

The only 12-cylinder car is the Lancia from Italy, which is a remarkable job with an angle of 22 deg. between the two rows of cylinders. Each row of cylinders is a block casting of six. While this is the only 12-cylinder at the show, it is understood that Delaunay Belleville and the Lorraine-Dietrich will build 12-cylinder designs later in the year.

The show has a number of new concerns in the automobile business, firms that have come into existence during or since the war. Some were small organizations previous to the war but now give promise of being factors in the industry. For example, Farman Bros. are building a high

class 6-cylinder job. Formerly they were in the aviation industry.

The Gnome and Rhone Co., which was a pioneer in the development of rotary aircraft engines and one of the big producers of these during the war, has been developing a car. Bellanger is also marketing an 8-cylinder in addition to the cheap model on which Briscoe co-operated.

A analysis of the chassis indicates that, in many respects, American practice is being followed. The spur to action in many cases has been reduced cost of production; in others it has been a turning to good practice.

The use of block engine castings is practically unanimous, this applying not only to fours and sixes but to one of the twelves. The practice of detachable cylinder heads has been very extensively adopted, some firms using it being Fiat, Lancia, Lorraine-Dietrich, Peugeot, Delahaye, Clement-Bayard, Suere, Bellanger and the British Austin.

Europe did not previous to the war take kindly to valve-in-the-head construction, due to the difficulty of silencing.



Henry Cezanne, show manager, offers flowers to President Poincare, as he is leaving the show. Barcn Petiet is on the President's left

Aviation practice has undoubtedly had something to do with picking up valve-in-the-head design which, while not used in the majority of cars, is coming to the front rapidly and will unquestionably be used largely next year. With the exception of the cheap model of the Lorraine-Dietrich, valve-in-the-head engines are all expensive jobs, using overhead camshafts with all mechanism completely enclosed and every attention given to lubrication. This design applies to the new aviation type Hispano-Suiza as well as the Lancia, Nazzato, Spa, Farman, Gnome and Bellanger.

Little progress or interest is shown in the all aluminum engine, the only example being the Hispano-Suiza, built on aviation lines and using steel liners which are screwed into the aluminum casting. The new Farman engine follows aviation practice, using steel cylinders with sheet steel waterjackets. Not so much progress as was expected has been made in unit castings of engine cylinders and crankcases, the cheap Renault being practically the only example of this design.

The Knight sleeve valve type of engine has stood still and the only European users are Panhard, Daimler and Voisin. Previous to the war several smaller firms were using it, but they appear to have dropped it. The poppet valve design is in the heavy majority.

Versatility in other valve designs is seen. Peugeot has a cuff valve type in a 6-cylinder model. It is a short type of valve in the cylinder head.

Piccard Pictet, the Swiss machine, continues its single sleeve valve engine. No other concerns are exhibiting poppet valve substitutes.

The war has given great impetus to the use of aluminum pistons and, conservatively speaking, 45 per cent of the

engines in the show have aluminum pistons. It is rather unusual that makers are not emphasizing this feature.

The ignition field is giving indications of following American practice. Electric starters are on practically all models. The magneto has lost some ground because of the introduction of electric starting and lighting. Engineers, however, appear to be afraid of offending public taste by leaving out the magneto and in some cases have maintained it while having a second ignition system in the motor generator. Hispano-Suiza has dropped the magneto on its high priced car. Darracq has dropped it on its 8-cylinder job. Lorraine-Dietrich has discontinued the magneto on its cheap model and has a patented system whereby the magneto and Delco generator are used with two sets of plugs and one distributor.

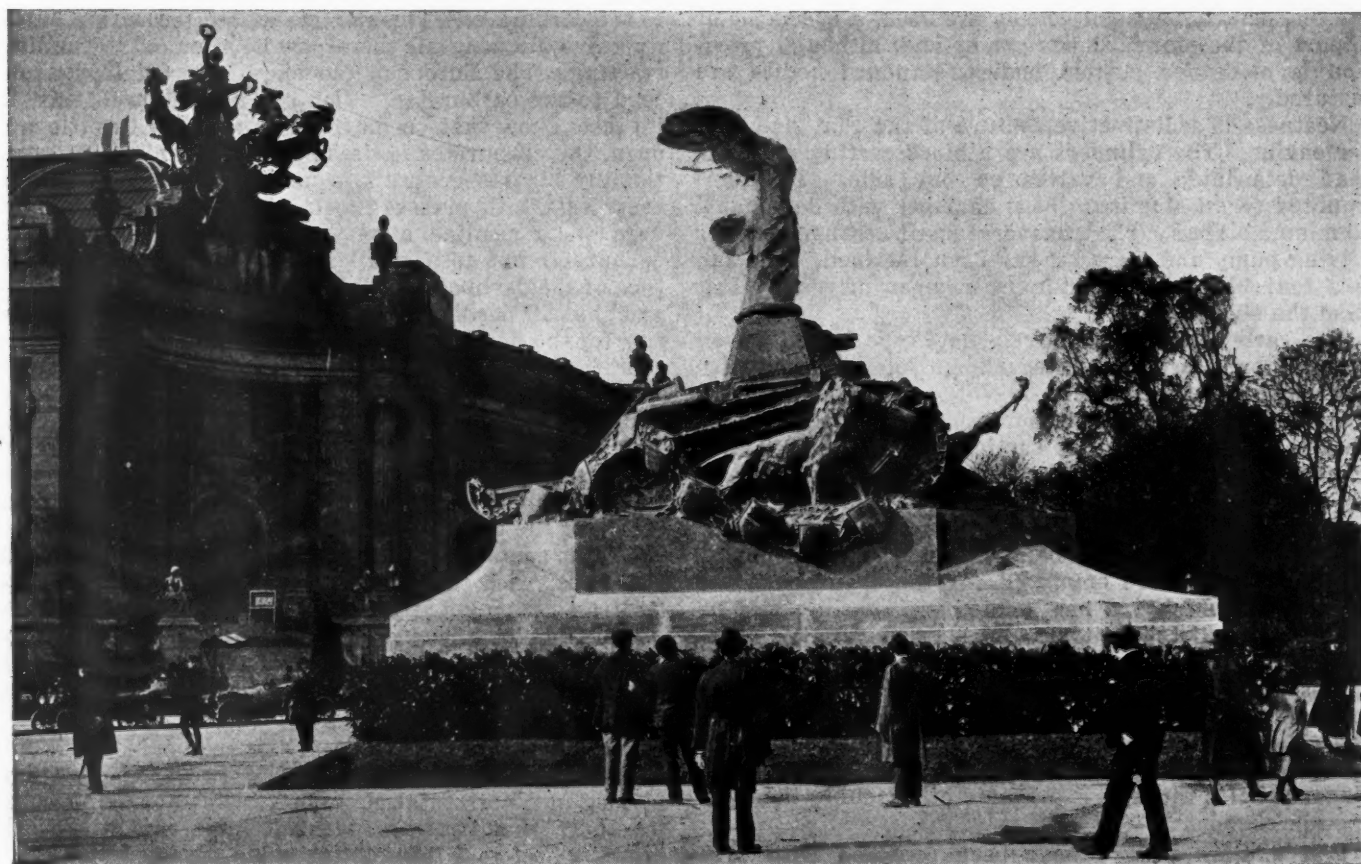
A vast majority of the car makers have adopted the unit construction engine gearbox with either three or four-point suspension. This generally comprises the engine base chamber, which is in one, two or three castings, and clutch housing and gearbox. Notable among the cars adopting this practice is the big 6-cylinder Farman.

The prevalence of bad roads, owing to war conditions, caused more attention to be given to chassis solidity, steering gears and more particularly to springs and brakes. Generally speaking, the frames are much deeper, in several cases running to a depth of 7 in.

An important increase is noted in the number of screw and nut steering gears. Also there is a tendency to mount steering gear boxes on the engine hangers instead of on the frame hangers, as has been the European rule.

Cantilever springs are prominent on all classes of cars.

(Continued on page 773)



Monumental tank in front of the Paris Automobile show

PARIS SHOW CORRESPONDENCE

Fiat Has Six and Two Four-Cylinder Models

Notable changes from pre-war practice by Italian maker include adoption of detachable head, semi-floating rear axle, lighting and starting system, detachable steel wheels. The engine shows influence of aviation practice. The oil pump has been changed from end of camshaft to engine base chamber.

FIAT has three types of touring cars, of which the most powerful is a six cylinder of 75 by 130 mm. (2.95 x 5.12 in.) bore and stroke. A four cylinder of the same engine dimensions also will be marketed as well as a small four of 65 x 100 mm. (2.56 x 3.94 in.) bore and stroke.

Compared with pre-war practice, Fiat has made several important changes, among them being the use of a detachable head and a semi-floating rear axle. Electric lighting and starting form an integral part of all Fiat chassis, detachable steel wheels are used, a speedometer is part of the standard equipment and, although provision is made for custom bodies, standard bodies are featured.

Neatness is a distinctive feature of the Fiat six-cylinder engine. The cylinders are a block casting with the head detachable and valves on one side. They are mounted on an aluminum base chamber with detachable aluminum oil pan. The transverse shaft arrangement for driving pump and magneto has been retained. The fan is a four blade cast aluminum member driven by belt from the engine shaft.

The carbureter is an entirely new type bolted up on the right hand side to an integral manifold. On the valve side complete accessibility is obtained by the special mounting of the electric generator and starting motor. Both these are of circular section and are carried in a split circular housing. The generator is just back of the timing gear housing but below the valve stem chamber. The starting motor is on the lower half of the base chamber but only slightly below the side frame members.

Four bearings are employed for the crankshaft, the diameter of which is 2 in. for the main bearings and 1.8 in. for the connecting rod bearings. The shaft has counterweights and is machined all over. Connecting rods are I-section steel forgings, machined all over and drilled for lightness. Cast iron pistons are used, these having three compression rings, a large diameter hollow wrist pin with the skirt drilled. An oil return groove with diagonal holes through it prevents oil reaching the combustion chamber.

Fiat engines always have been provided with high pressure lubrication to all parts but the wrist pin. In the new models, the oil pump, instead of being on the end

of the camshaft is in the engine base chamber. This latter has a filter its full length and also a float with dial to indicate the level of oil. There are two combined breathers and fillers on the carbureter side.

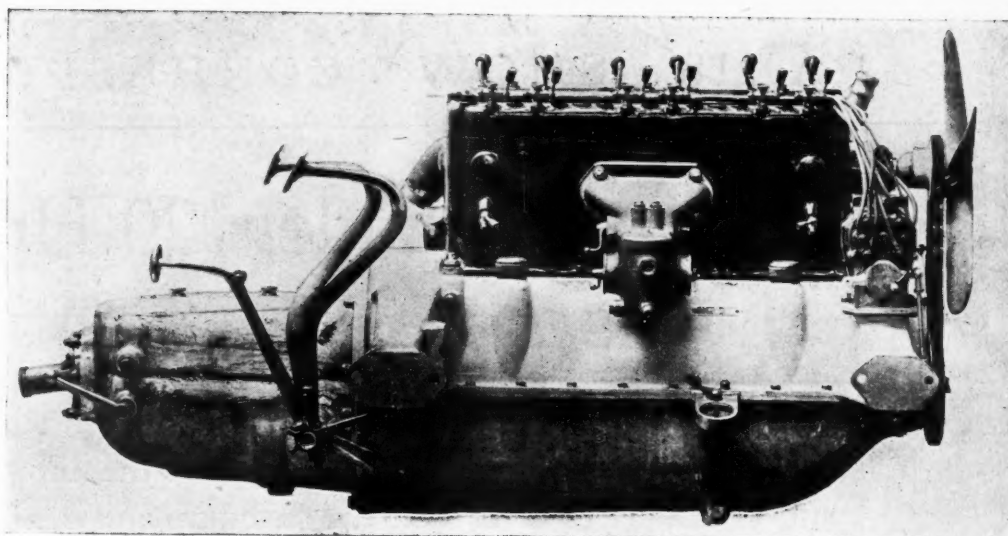
A single float, double jet carbureter is used. This has both hot and cold air intakes, the latter being adjustable. Instead of the air being drawn through gauze covers on the valve stem plate, the intake is now on the rear face of the block casting, the air thus admitted passing around the valve stems and the cylinder block, where it is heated, to the carbureter. This air intake is fitted with a butterfly valve allowing all the air to be shut off to facilitate starting. The European tendency is to employ vacuum feed to the carbureter. Fiat has not followed this, for its tests show that on long hill work, with throttle wide open, the carbureter is liable to starve unless an exceptionally big reserve tank is used. On this account, the rear tank, with pressure maintained by an air pump, is used. The gasoline, however, does not flow direct to the carbureter but to a small reserve tank on the forward face of the dashboard. This tank is provided with a float and shut off needle. With this system, there is no necessity for the hand pump to obtain the initial pressure, and therefore it has been abolished.

The six cylinder Fiat has unit construction of engine and gearbox, with four point attachment to the frame. The gearbox is a single aluminum casting, without any horizontal division, bolted to the rear face of the engine base chamber. It has a single lid, running the full length of the box and is divided into three compartments, the front containing the multiple disk clutch, the second the gears with the selector rods attached to the cover and the rear compartment containing the forward universal and brake mechanism. There is practically no possibility of oil leakage, for joints have been reduced to the one at the universal. Brake, clutch and accelerator pedals are mounted on the gearbox.

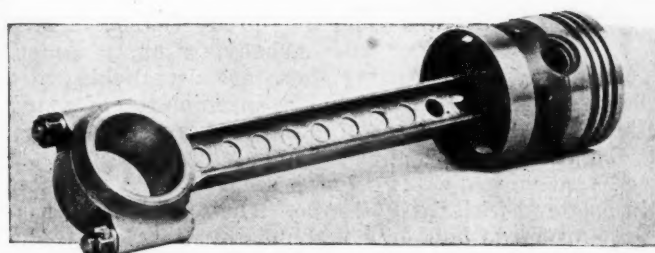
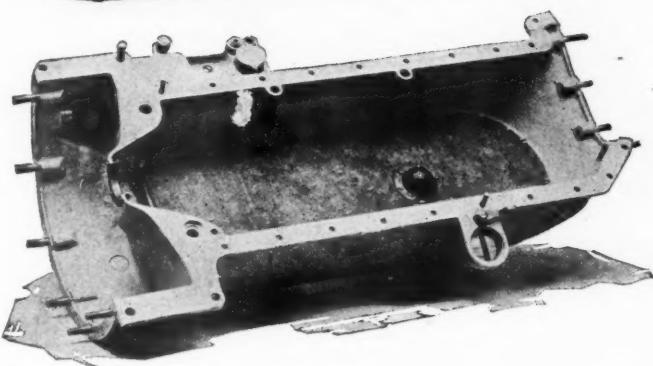
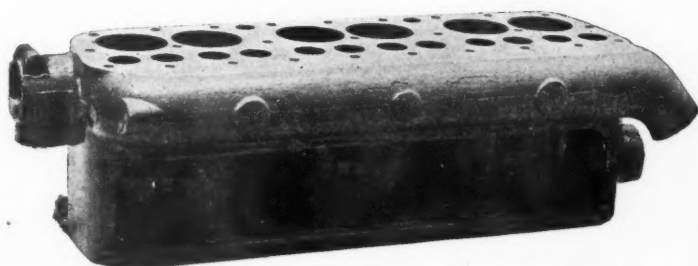
Changes have been made in the rear axle. It is still formed of a housing composed of two steel stampings divided in a horizontal plane but, instead of being bolted together, the two are welded into one whole, the crown wheel and differential being inserted through a detachable aluminum plate on the rear of the axle hous-

(Continued on page 781)

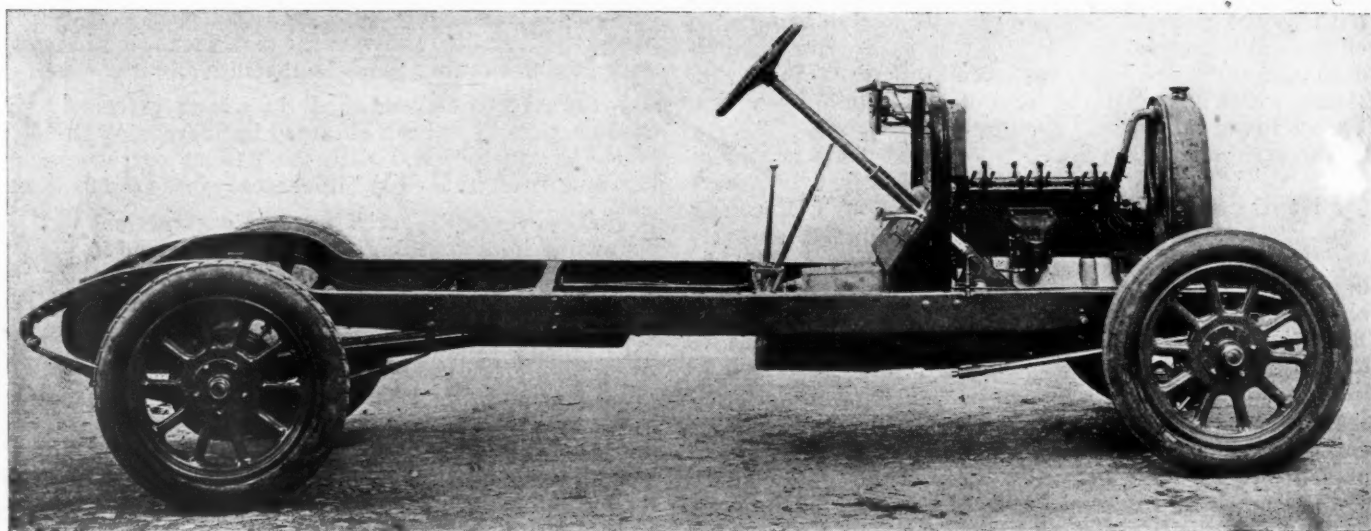
The New Fiat Six Cylinder 'Engine



The Fiat engine



The Fiat is remarkable for its clean design. The cylinder block, with detachable head removed, is shown. The integral fan bracket is a rather novel feature



The Fiat chassis—a large amount of free space has been left under hood

PARIS SHOW CORRESPONDENCE

Darracq 8-cylinder, 20 Hp. Engine Has American Features

Car designed by Owen Clegg, former Rover engineer, has increased accessibility of engine parts by the integral manifolds and cross shaft for driving water pump and generator. Detachable cylinder head, unit construction and change speed on top of gear box are incorporated.

DARRACQ has gone into production on a 20 h.p., eight-cylinder car embodying many American features. Among these are detachable cylinder head, unit construction, change speed on top of gear box, Delco ignition, Timken roller bearings and Gleason gears.

This car is the work of Owen Clegg, who before coming to France a few years prior to the war made a reputation in England with the Rover Co. The present model is the first produced by Clegg without any Darracq trammels. Cylinder dimensions of the engine are 70x130 m.m., the two blocks being single castings with integral intake and exhaust manifolds. The latter is on the outside, with the exhaust pipe connected direct to it on the center of the block. There is no underpan and the exhaust passes directly under the chassis frame members to the exhaust box at the rear. The cylinder castings are stove enameled in black, thus giving them a smooth finish.

Complete accessibility of all engine parts has been obtained by the integral manifolds and by the use of a cross shaft for driving off its two extremities the water pump and the Delco generator. A Coventry silent chain is used for driving the single camshaft and helical gears for the cross shaft. The carbureter, a Smith four jet, built by the Darracq company, is mounted in the center of the angle formed by the two blocks of cylinders and does not interfere with the accessibility of the valve stems, which are enclosed by polished aluminum plates. Vacuum feed is used.

The crankshaft is a special alloy steel forging with a diameter of 50 m.m., carried in three plain bearings having lengths of 80 m.m., 75 m.m. and 90 m.m. Connecting rods are I-section forked typed and machined all over, having attached to them light cast-iron pistons with big diameter hollow wrist pins. There are two stepped rings above the wrist pin and one below to act as a scraper. There is a spiral oil return on the end of the crankshaft to prevent oil leakage. Close attention has been given to this feature and there is absolutely no oil leakage.

Lubrication is of the force feed type, with all the oil contained in the base chamber and delivered under pressure to the main bearings, through the hollow shaft to the connecting rod ends, and up oil leads on the connecting rods to the wrist pins. There are two breathers and fillers, one of these being at the front, behind the

timing gear housing, and the other at the rear of the engine. The latter contains the double oil filter and the oil pressure relief valve, all of which can be lifted out, cleansed and put back in a moment without tools. The oil pan is an aluminum casting ribbed to assist cooling and detachable without interfering with the engine bearings. The water pump may be taken down by removing the bolts, and the gland also may be repacked without taking down the entire pump.

The engine has four-point attachment to the frame members, and all the space between the engine webs and the side frame members is filled in.

Ignition, being standard Delco, does not call for any special description. The distributor is at the rear of the cylinder blocks and is driven off the vertical shaft. This also operates the oil pump in the base chamber. From the distributor the wires are led in metal conduits bolted to the cylinder blocks. The electric starting motor is placed alongside the gear box and engages with teeth cut on the periphery of the enclosed flywheel.

Gearbox and clutch housing form a single aluminum casting, the box not being split horizontally. One of the features of the gearset is that the constant mesh pinions are at the rear. Thus, when the car is standing in neutral with engine running there is absolute silence.

Every effort has been made to get an extremely rigid chassis. This has been obtained by increasing the depth of the frame to 6.3 in with the flanges correspondingly big, and by an unusually big central cross frame member.

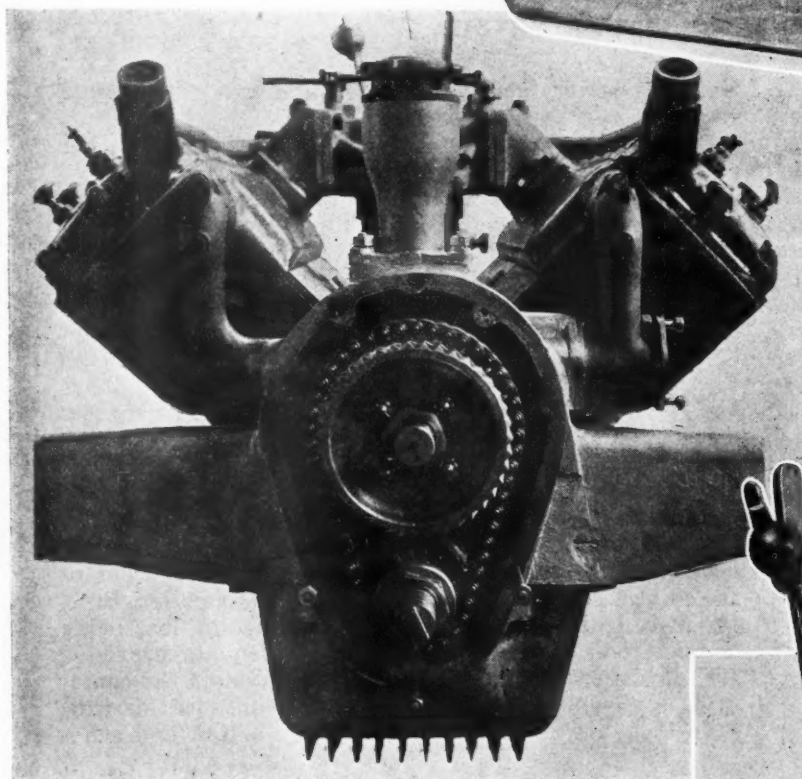
The rear axle is entirely new construction and is a departure from anything previously produced in the Darracq factory. The axle housing is a banjo type steel forging with both front and rear plates in aluminum castings. It is semi-floating, with Gleason gears, and is fitted with Timken roller bearings.

Suspension is by means of semi-elliptics in front and cantilever springs at the rear. One of the features of the latter is that there are practically two main leaves, one of them having its eye formed by the end of the spring being turned upwards, and the other by the end of the spring being turned downwards. This gives an

(Continued on page 758)

Views of the New 20-Horsepower Darracq

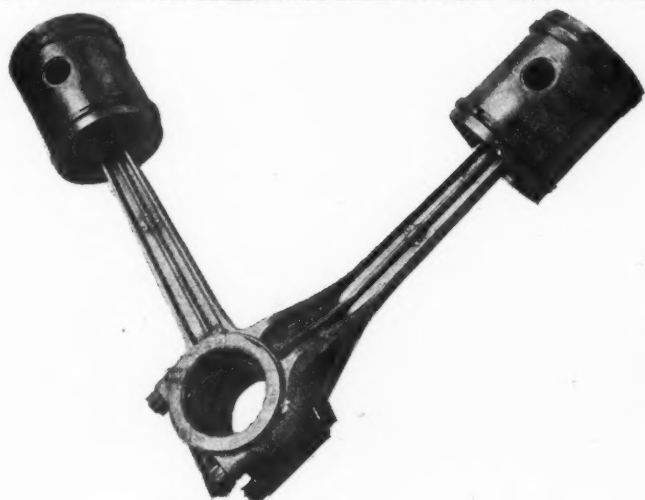
The eight-cylinder engine unit, with clutch, gearbox and all controls, is shown here. Below is the chain drive from crankshaft to camshaft. The convenient filler and breather will be noticed in the angle of the cylinder block.



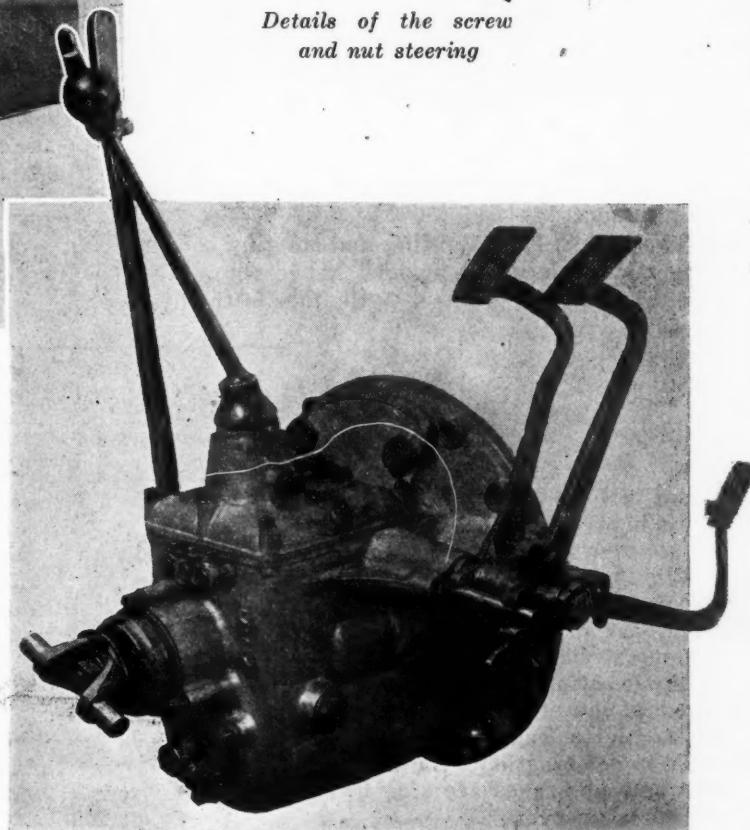
Chaindrive from crankshaft to camshaft



Details of the screw and nut steering



Connecting rods and pistons



The gearbox and clutch, with all controls

PARIS SHOW CORRESPONDENCE

Unic Produces Single Engine

The only change of power plant for commercial use is the governor. Four cylinders, 80x130 mm., use a two-bearing crankshaft, with valves enclosed on one side. Double cantilever springs are used to permit employment of Hotchkiss drive. Eyes of the springs are bored in solid. The second is the same size as the first leaf but thinner. Touring, closed and colonial cars and 1 and 1½ ton trucks on program.

A SINGLE engine for three types of touring car chassis and for two light trucks is the program adopted by the Unic Co. The chassis are a normal touring type, a reinforced type for heavy closed bodies and a colonial type. The trucks have a capacity of 1 and 1½ tons and their engines are governed down. Otherwise they do not differ from the types of engines used in the touring car.

This four-cylinder engine, 80x130 mm., uses a two-bearing crankshaft and has valves on one side all enclosed, with carbureter on the valve side of the engine. The only changes in the engine are aluminum pistons and the addition of an electric lighting and starting set. The electric generator is mounted on an aluminum bracket just above the timing gear housing and is driven by a Whittle belt from the crankshaft. The radiator fan is mounted on the generator shaft, thus securing one drive for the two organs. The cast aluminum two-blade fan is within a casing fitted round the rear face of the radiator with an opening equal to the diameter of the fan, thus effectively assuring a draft over the whole of the radiator surface.

The two-unit S. E. V. lighting and starting set has the starting motor placed alongside the gearbox, with engagement by exposed gear cut on the face of the flywheel.

Unic has maintained magneto ignition and has adopted vacuum feed to the carbureter.

Before the war, this firm employed a double leather disk coupling between engine and gearbox. The principle has been retained but, instead of leather, which was found to be somewhat variable in quality, a special rubber and canvas compound, the composition of which is said to be patented, is used.

The greatest change made by Unic is at the rear end. Except for the use of spiral bevel gears, the axle has not been modified. The springing, however, is special, being by means of double cantilevers, one being mounted above and the other below the axle. This arrangement enables the Hotchkiss drive to be maintained, a feature on which Unic has always specialized. Most other makers who have taken up cantilever springs have had to abandon Hotchkiss drive with this change.

One of the features of the springs is that the eyes are not formed by turning up the ends but are bored out of the solid. The second leaf is exactly the same length as the main leaf but is thinner, each succeeding leaf being thinner than the one preceding it. Adequate provision for lubrication is made by placing greasers on the center of each shackle bolt instead of at the end. In this way, grease cannot escape at the extremity before it reaches the bearing surfaces.

The Darracq Has American Features

(Continued from page 756)

forging, by which the attachment is made to the axle, is split in a vertical plane. All spring eyes are bushed and graphite impregnated.

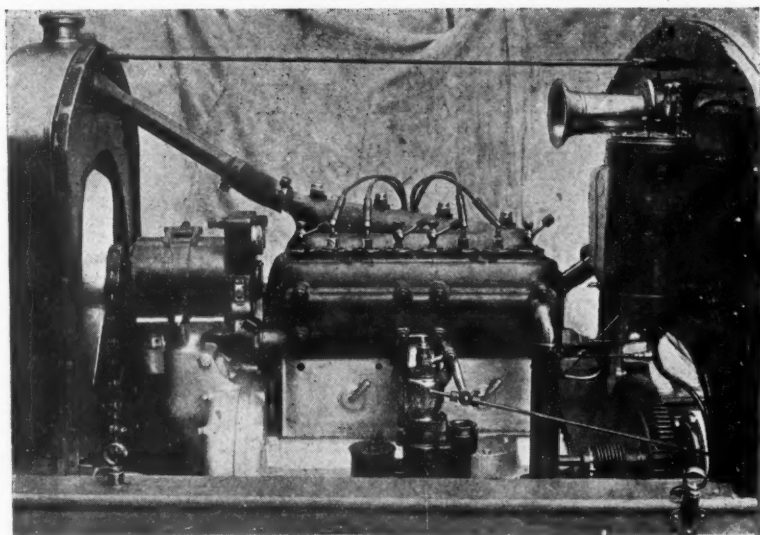
The steering gear is new and is of the screw and nut type. This particular type of steering is becoming popular, particularly on the higher grade European cars. The steering gearbox is bolted to the right-hand rear hanger of the engine base chamber, with the view of avoiding the whip sometimes prevalent when the steering gear is attached to the frame members. Because Darracq exports largely to England, right-hand steering has been retained in combination with left-hand levers.

Both sets of brakes are side by side on ribbed rear-

wheel drums. The feature is that, instead of each brake having two shoes, it has four, so that practically the whole of the circumference is used as braking surface.

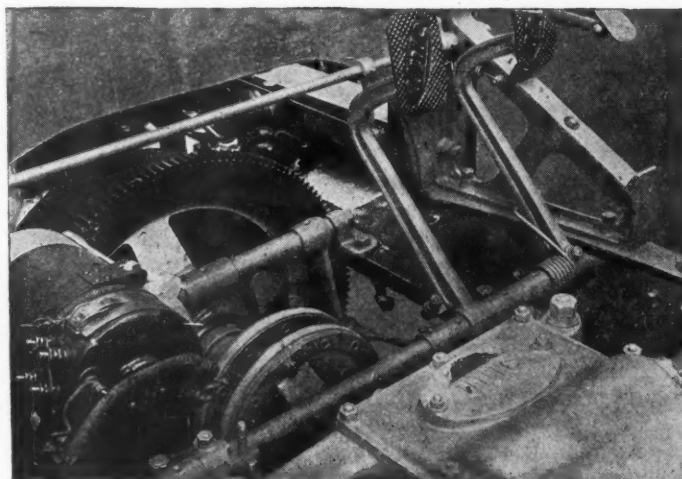
Darracq has attempted with this production to get into the high-class car trade, and in order to do so has combined careful design with an extensive use of special alloy steels. At the same time it has been sought to put the car on the market at a really competitive price. The price, however, has not been definitely announced.

Wheelbase of the car is 138 inches and track 53 inches. Wheel equipment is Michelin steel disks as standards and detachable wire wheels as an extra. Tire size is 895x135 mm.

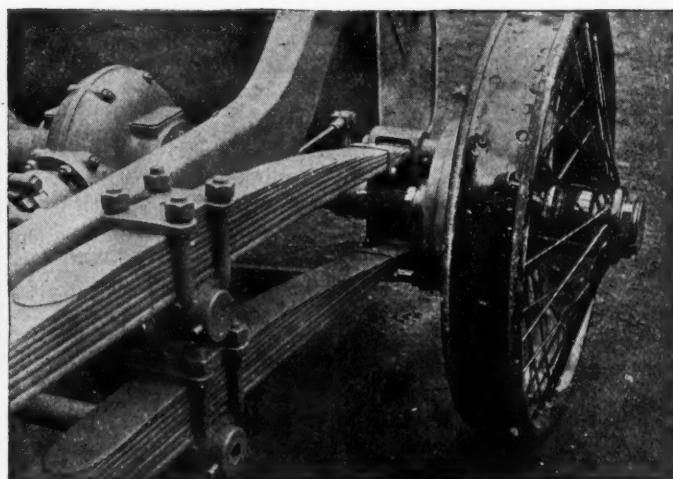


The Unic engine

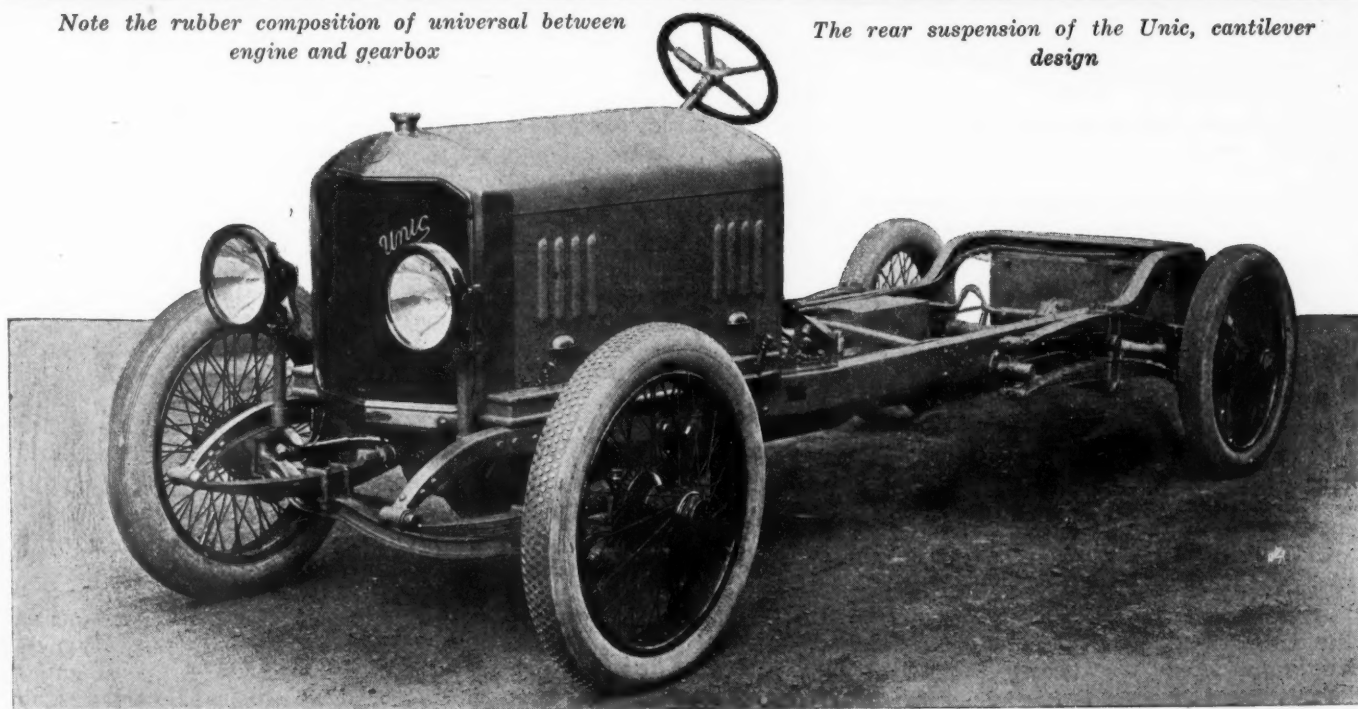
The Unic Has
a Four Cylinder
Engine For Both
Car and Truck



Note the rubber composition of universal between engine and gearbox



The rear suspension of the Unic, cantilever design



The Unic chassis—note the suspension

PARIS SHOW CORRESPONDENCE

Suere Eight Cylinder Engine
Only 1.77 by 3.54

The V type motor, of two castings, has the smallest bore for the number of cylinders ever built in France, and was designed for quantity production. Two sections of four cylinders are bolted along vertical line to form eight without oil pan. Detachable head and valves are on one side, stems being almost horizontal. Cams on shaft are machined out of solid.

THE smallest bore engine built in France is the Suere 8-cylinder, 45 x 90 mm. (1.77 x 3.54 in.). This engine is fitted in a light chassis carrying a two or three seat body and thus forms a car that, for all ordinary purposes, is a constant top gear performer.

The engine is a V-type of two castings only, each one comprising four cylinders and half a crankcase. These two parts are bolted along a vertical line to form the complete eight cylinder engine without the addition of an oil pan. The job has been designed for economical quantity production and labor saving machinery and jigs have been prepared with that end in view. The cylinder heads are detachable and the valves are on one side but, as their stems are considerably inclined in relation to the cylinder barrel, the stems are almost horizontal. There is a single camshaft with 16 cams, all being machined out of the solid.

The crankshaft is carried in two plain bearings. The connecting rods are mounted side by side, for the two blocks are offset, although this is not apparent externally, owing to the length having been equalized by the water jackets. Aluminum pistons weighing 3½ ounces complete are used, the hollow wrist pins being free to turn in both the piston bosses and the rod. All eight connecting rods are machined at one operation.

The outer face of the lower portion of each crankcase is covered by an aluminum plate, these being sufficiently large to allow the bearings to be inspected and a rod and piston to be removed complete. The oil reservoir is the lowest portion of this casting and has immediately above it the four constant level troughs by means of which the connecting rods are fed with oil. One of the aluminum cover plates has cast on its inner face the main oil lead, which, of course, permits easy cleaning. The oil pump is in the base chamber and is of the plunger type, operated by an additional cam on the camshaft.

Valves are 22 mm. in diameter, or practically half the cylinder bore. The exhaust manifold is cast with the cylinder block and emerges at the rear of each block. This allows a pipe with easy bends to be led to the muffler placed across the chassis at the extreme rear. The valve stems are enclosed but, owing to their angle, the cover

plate is horizontal. Immediately above this and in the center of the angle formed by the two blocks of cylinders, is the double carbureter with a single float. Wing nuts are used extensively and practically the whole of the carbureter can be dismantled without tools.

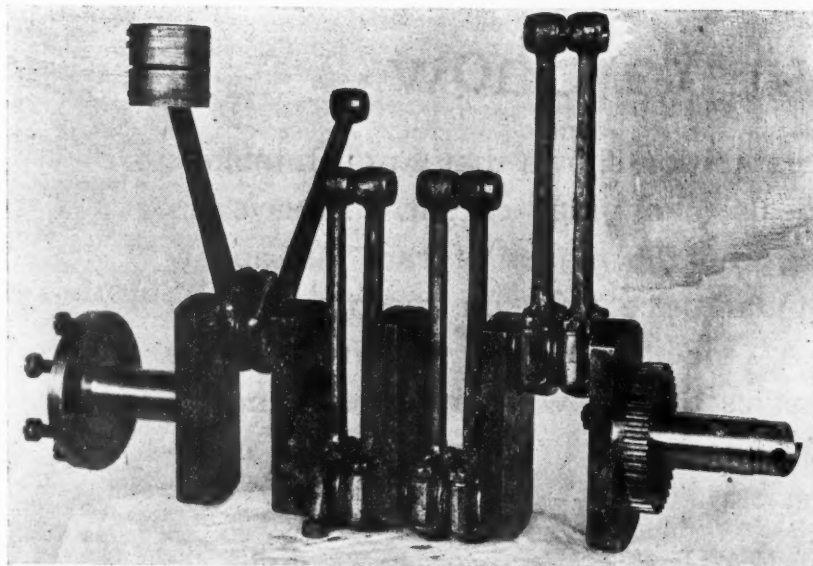
Ignition is provided by a Delco generator placed at the front of the engine and driven from the camshaft pinion. The distributor is immediately above it, the wires being led to the two sets of plugs in the cylinder heads through metal conduits. At the rear, in the angle of the cylinders, there is mounted a single air-cooled cylinder compressing air for tire inflation. This is driven by an eccentric on the camshaft and is engaged by a lever.

The gear set and clutch form a unit with the engine. The cylindrical housing, with a bolted-on rear plate, is secured by studs to the rear face of the engine base chamber and is an aluminum casting. Three point suspension is provided for this unit, there being a trunnion attachment at the front to a transverse frame member and two point attachment at the rear to another cross member. There are three speeds ahead and reverse, with the distinctive feature that, on top, all intermediate pinions are disengaged.

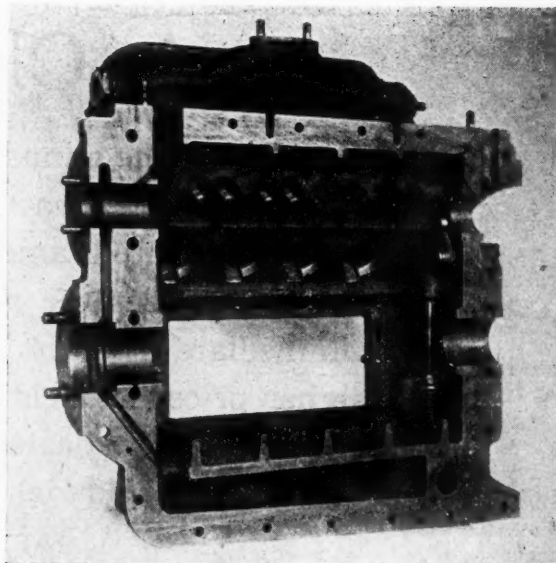
Although electric lighting is provided, it has not been thought necessary for this small engine to fit an electric starter. Instead there is a mechanical starter mounted entirely inside the gearbox and operated by a lever, one stroke of which turns the engine a quarter revolution. With Delco ignition and eight cylinders, a start is always certain on the first pull. Both levers and pedals are mounted on the gearbox. A feature of the pedals is that they have round countersunk heads into which are fitted big diameter rubber heels, exactly similar, except in the matter of size, to those used on shoes. Clutch and brake pedals are adjustable for length.

The type of clutch employed is unusual, as it consists of a light steel cone inside a cast iron female member. This runs in oil and the cone is provided with rather deep oil grooves that allow the lubricant to escape as engagement takes place. It is claimed that, as a certain length of time must elapse before all of the oil is driven out, a progressive engagement is assured.

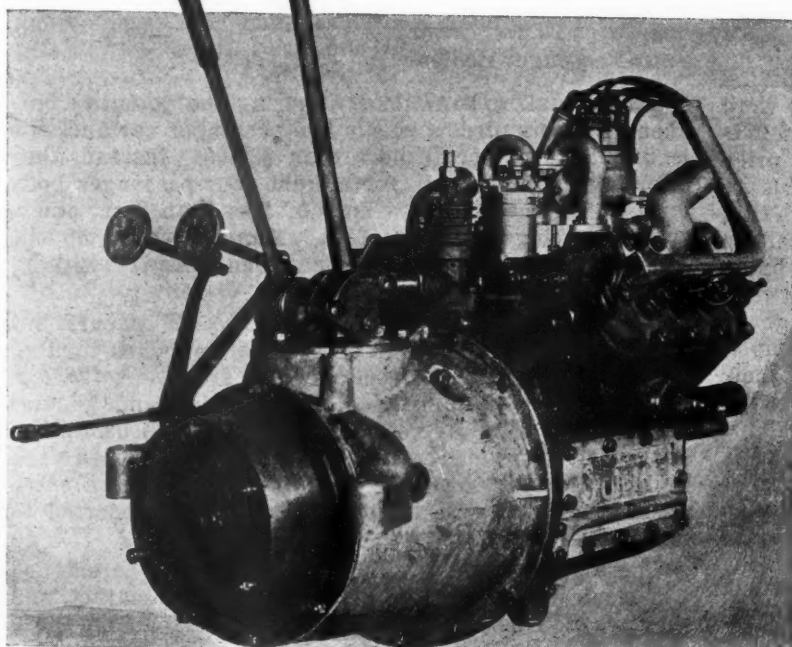
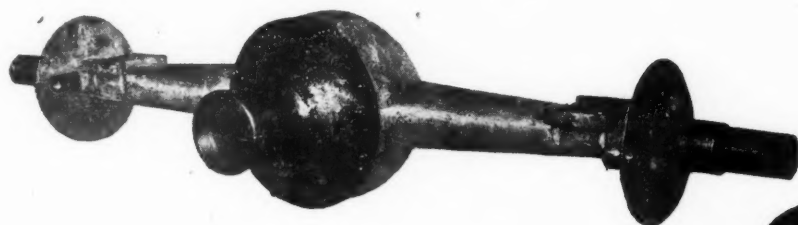
The Midget Eight Cylinder Suere



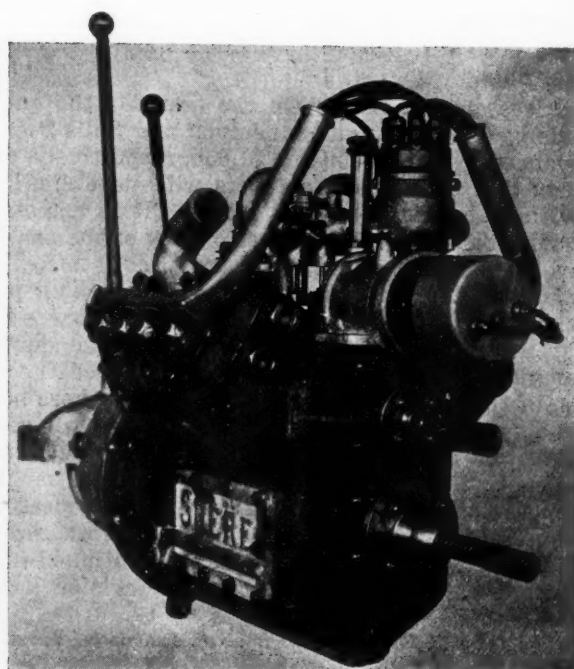
The crankshaft, rods and piston



Above—Four of the cylinders and one-half of the crankcase. Below—The armored aluminum axle of the Suere



The Suere powerplant



Mounting of the Delco generator and distributor

High Priced Cars Predominate At Olympia Show

The revival of the annual exhibition shows that English makers are clinging to pre-war ideals to a great extent. America is poorly represented among the 106 makes of cars but apparently monopolizes the popular price field on machines ready for immediate delivery. A tendency toward airplane practice in higher priced models makes the show more interesting to engineers than to dealers, who are often disappointed on questions of prices and deliveries.

By M. W. Bourdon

Special by Cable.

London, Nov. 9.

GREAT BRITAIN'S thirteenth national automobile show opened yesterday with the greatest crowds known in the history of the event. On the second day the doors had to be closed in order to prevent overcrowding of the hall. Large numbers of visitors had come to London from all parts of the British Isles as well as from foreign countries.

All former records were broken as regards the number of exhibitors of complete cars and accessories; there are 106 makes of cars shown and the show is more truly international in character than was that of Paris. America is rather poorly represented, mustering only 15 makes, while France shows 24 makes, Italy six, Belgium one and Switzerland one, the remaining 59 being British. Fifty per cent of the exhibitors show real post-war models, while the remainder have models which, while also designated post-war, probably will be of a transitional character only.

Prices are not fixed. On the first day the quotations made by Austin, Angus Sanderson and Rolls Royce were advanced by \$425, \$600 and \$1,050, respectively, and it is likely that other manufacturers will make similar price revisions before the show closes. It is impossible to promise definite delivery dates on any of the models that have been developed since the armistice; some exhibitors make tentative promises for February, which probably means April, while others set the date anywhere between May and September. Labor troubles and shortage of raw materials during the past year delayed the completion of the experimental models. Some makers had their models completed in August, but are not yet ready for production because they lack dies, jigs and castings.

The British manufacturer has not had much of a chance since the armistice to prepare to meet foreign competition in the 1920 home market. Potential buyers for all classes of cars protest at the continued increases in price, but it is rare that a price revision leads to a

cancellation of orders already given. If there are any cancellations, there is invariably a scramble to take up the deliveries thus rendered available, at increased prices.

American manufacturers of low-priced four and five passenger cars rated at from 16 to 20 h.p. have an almost clear field in the British Isles, for, with one or two exceptions, the British makers show no signs of producing that type of car at less than \$2,500 for the 1920 season, thus leaving Overland, Chevrolet, Dodge, Maxwell and other American makes almost without competition from home factories, and that, too, despite the import duty.

There is only one British car of that type now listed at less than \$2,500, namely, the four-cylinder $3\frac{1}{2} \times 5\frac{1}{2}$ in. Cubitt, which sells at \$1,480. It is doubtful whether this price will still hold when deliveries begin. The Cubitt, moreover, is not on exhibition.

Four-Passenger Bodies

British makers are almost ignoring the potential purchaser who requires a roomy five-passenger car and who is unwilling to spend more than \$2,500. Instead, they offer a smaller chassis for a light four-passenger body with an engine having a bore of less than 3 in. and a stroke varying from 4 to 6 in. Many of these models, however, exceed the price named when equipped with an electric lighting and starting outfit.

By the usual British rating, these are 12 h.p. cars, but the engines are of the high speed type, and when turning over at 2,000 r.p.m. or more, develop from 20 to 28 h.p. In speed, hill climbing, fuel consumption and general performance they give satisfaction to British users, but the majority are susceptible to over-load and, when used in hilly districts or when carrying one or more extra passengers, the gear shift lever has to be resorted to quite often.

These chassis are the British reply to the threatened American invasion of the British low-priced market, and they are obviously quite different in character from those the Americans offer. The Austin, in particular, represents excellent value as compared with 1914, when it is

*The delay in publishing this issue of Automotive Industries, due to difficulties over which the publishers have no control, makes it possible to print this article in the issue of October 16. It has just been received by cable.

taken into account that manufacturing costs are now practically double what they were at that time.

Dealing with the show and the impressions conveyed, one finds very pronounced contrasts. While, on the one hand, are to be seen chassis embodying the most advanced ideas and incorporating airplane practice and material, on the other, one finds models which are almost identical with those exhibited by the same makers at the last previous London show held in 1913. But even these less progressive makers have their 1920 output already sold, according to statements of their sales departments. No doubt makers or dealers with cars of almost any type or price who can make delivery within six months can readily sell all of them. There are a dozen buyers for every new car available.

From the potential buyer's point of view, the show is disappointing. He may visit a great number of stands without finding one where orders for reasonably early delivery will be accepted. Dealers have some cars that are not allotted, though in that case again the delivery dates are either far off or indefinite.

To the automobile engineer, on the other hand, the exhibits generally are of intense interest, especially those of high-class makes, such as Lanchester, Napier, Sizaire-Berwick, Ensign and Straker-Squire. In these makes one finds the greatest divergence from pre-war practice and the most pronounced differences in designer's ideas. There has been no general movement towards sixes, eights and twelves, the four-cylinder retaining an undisputed lead. Of all the cars and chassis exhibited, 70 per cent carry four-cylinder engines, 17 per cent six-cylinder, 6 per cent eight-cylinder and the remainder either, two, three, five or twelve cylinder. In arriving at these percentages, cars of all nationalities were included. The new high priced British cars, with one exception, are six-cylinder machines, the exception being the eight-cylinder Guy.

An analysis of 50 British strictly post-war models, with respect to valve location, shows the following percentages: L head, 63 per cent; I head, 29 per cent; Knight sleeve-valve engines, 6 per cent; miscellaneous, 2 per cent. Fifty per cent of these engines have detachable cylinder heads. Eighty-seven per cent have magneto ignition; 9 per cent carry both a magneto and battery ignition, while 4 per cent have battery ignition only. Twenty per cent of the cars carry the gearbox on the engine. Cantilever springs are used on 28 per cent of the models, semi-elliptics are carried on 44 per cent, three-quarter elliptic on 16 per cent and one-quarter elliptic on 12 per cent. As regards final drives, 34 per cent use the worm drive, 29 per cent spiral bevel and 37 per cent straight bevel gears.

Overhead Valves

In England, France and Italy the adoption of overhead valves is largely confined to high priced jobs. Practically all the engines with overhead valves also have overhead camshafts, Siddelly being a notable exception with push rods extending up the sides of the engine. The majority operate the valves through the intermediary of rocker arms, but in the Hispano and Dawson the cams act directly on the valves. Patents on this construction in all industrial countries are claimed by Hispano.

In many high grade chassis, aluminum is more widely used and, while the power-weight ratio has increased on the whole, the improvement is due more to greater specific output of the engines than to weight reduction because of lighter material. The 1920 Rover is a case in point; while the chassis weighs approximately the same as the 1914 Rover model, the engine develops from 15 to 20 per cent greater power, this result having been achieved

by improved design of the induction and exhaust passages, the combustion chamber shape and the water-jacket, and by better carburetion.

Among cars in the medium priced class, which includes all those selling at \$2,600 to \$4,500, the Siddelly overhead six stands out prominently. It exhibits Marmon practice in the frame and transmission, cantilever springs and single disk wheels. The transmission gives three forward speeds and has the control lever centrally mounted upon it.

This chassis is widely quoted as the best value in the show, selling at \$2,950, with complete electric equipment but without body. Many British competitors maintain that it is impossible to produce the car under present conditions at that price and make a profit. An output of 5,000 is planned for 1920, but deliveries are not yet in sight.

Many New Cars

The new Wolseley four-cylinder 15 h.p. model may reach a production of 10,000 during 1920. It has a bore of $3\frac{1}{8}$ in. and a stroke of $5\frac{1}{8}$ in., a three-speed transmission, final drive by worm and wheel, quarter elliptic springs both in front and rear, battery ignition and 118 in. wheel base. With a four-passenger body, the car sells at \$2,400. The Wolseley firm also has a 10 h.p. four-cylinder model with $2\frac{1}{2}$ in. bore by $3\frac{3}{4}$ in. stroke, the engine design being similar to that of the 15 h.p. car. This makes a high grade light runabout at \$2,100. A six-cylinder car with side valve type engine of the same cylinder dimensions as the four-cylinder 15 h.p., with five-passenger body, sells at \$4,800.

Many newcomers are making their debut at the show, most of them exhibiting four-cylinder models and several aiming at outputs up to 5,000 a year, but it is unlikely that this rate will be reached in 1920. The Ruston Hornsby, a 16-20-h.p. four-cylinder model with $3\frac{1}{8}$ x $5\frac{1}{8}$ in. engine, will be the product of a consolidation of several well-known general engineering concerns. It is a five-passenger car selling at \$2,500 and one of its features is that the gearset is combined with a rear axle. Another general engineering firm, Harper's Sons & Bean, is organizing for an output of 10,000, having engaged production experts from the United States.

The demand for British components from assemblers is likely to be met early next year by two or three new concerns working in conjunction with engineering firms which were greatly enlarged during the war and now require a new field for their activities. Automobile engineers are providing designs that such plants will produce under contract. British engine specialists can deal with their side of the problem, while, hitherto, there has been only one firm offering transmissions and axles, that of Wrigleys, which, moreover, is now almost fully occupied with the work it is doing for Angus Sanderson.

There is only one British eight-cylinder car at the show, made by Guy Motors. This company so far has confined itself to the manufacture of motor trucks, but the managing, designing and sales staff were drawn from firms making well-known touring chassis, chiefly from the Sunbeam plant. The engine has a bore of $2\frac{3}{8}$ in. and a 5 in. stroke and is of the V type with detachable cylinder heads. The valve arrangement is the same as that on the truck engine recently illustrated in Automotive Industries.

Two light cars with 10 h. p. radial air-cooled engines are being exhibited, viz., the Enfield Allday with five cylinders and the Cosmos with three cylinders. The latter is a two-seater runabout selling at \$850, and is designed for quantity production, deliveries beginning in September.

Varied-Duty Engines in Buda Series

Eight Models, of the Four-Cylinder L Head Type, Make Up a Line Designed to Meet All Truck and Tractor Requirements—Construction Details of This Series Show an Engine Combining Many Features of the Latest Ideas in Building Such Equipment—Much That Should Interest Every Designer and Engineer of Gasoline Power Plants Is Revealed in the Specifications of This New Series.

HAVING specialized on heavy type engines for truck and tractor work for some years, the Buda Co. has now developed a complete line, comprising eight different models. This covers a wide field of truck and tractor requirements.

The models are designed in pairs, both models of each pair using the same crankcase. All are four cylinder engines with L head cylinders, detachable heads and force feed oiling systems. Following are the model designations, cylinder dimensions and piston displacements of the eight models:

	In.	Cu. in.
Model DTU.....	3½ x 5¼	202
Model CTU.....	3¾ x 5¼	232
Model FTU.....	4 x 5½	276.5
Model ETU.....	4¼ x 5½	312
Model XTU.....	4¼ x 6	340
Model YTU.....	4½ x 6	382
Model ATU.....	4¾ x 6½	461
Model BTU.....	5 x 6½	510.5

The same lines of design are followed throughout. The following description of Model YTU, the 4½ x 6 in. engine which seems to be the size in greatest demand, will give a good idea of the whole line. The company does not plan to discontinue any of its previous models.

The four cylinders of the Model YTU are cast in block, with an open space between the second and third cylinders. The removable cylinder head is held down with twenty-two cap screws. The cooling water outlet from the head is through a removable casting that can be turned in either of four directions, thus permitting easy application to a transverse engine

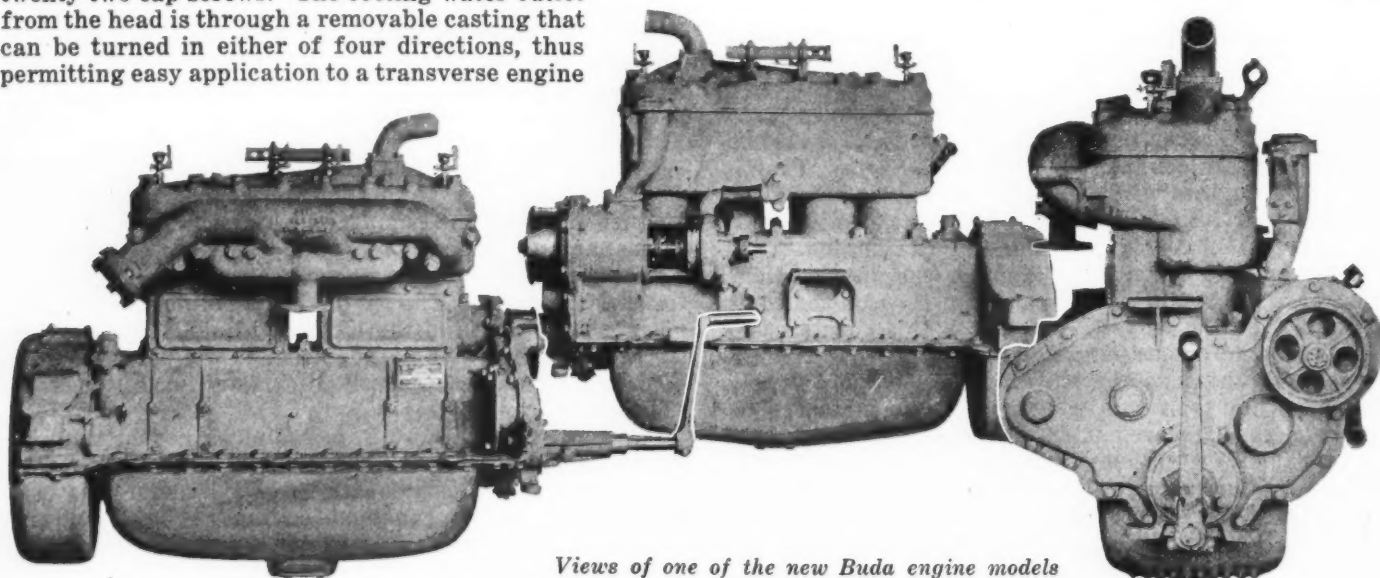
layout in tractor design. Spark plugs are located at the high point in the cavity of the head.

The valve ports and their openings in the block terminate on the right hand side of the engine, where a special combination intake and exhaust manifold is fitted. The removable covers exposing the valve stems and tappets are easily accessible and are not interfered with in this respect by any overlapping part. The clear diameter of the valve is 2⅞ in. and the valve lift is 7/16 in. The valves are made of high tungsten steel and operate in removable guides.

A barrel type of valve spring is used, which tends toward self centering and elimination of the side thrust of the valve on the guide. The lower end of the valve spring and valve spring cup is held fast by a split type valve retainer which permits of no movement up or down and thus eliminates wear on the valve spring retainer lock or the groove in the end of the valve stem. The tappets are of the mushroom type and operate in separate guides held in place in pairs with crowfoot clamps, readily removed by loosening one screw. The tappets are large in diameter, as are the adjusting nuts, which makes it necessary for the mechanic to use a wrench on the nuts rather than a pair of pliers.

Crankcase Construction

The crankcase is in two sections, this construction being necessary because the cylinder blocks were designed



Views of one of the new Buda engine models

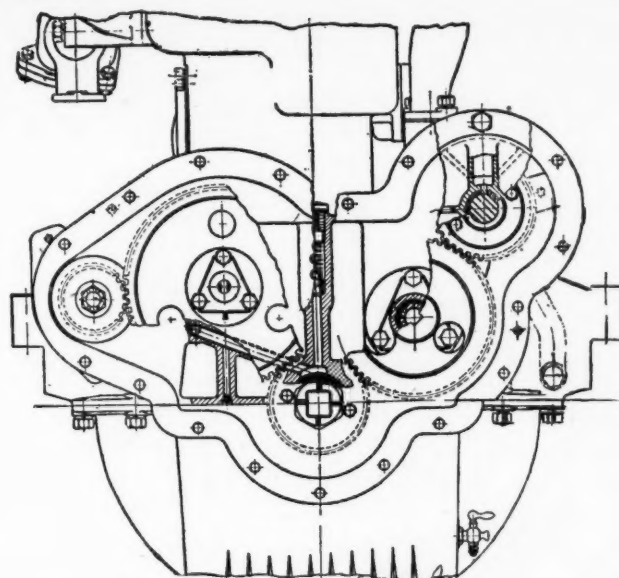
in pairs, either of the pair fitting the one crankcase. The case is of gray iron and the halves are divided horizontally at the crankshaft center. The upper half contains the crankshaft bearings and extends over the flywheel to form the upper half of the bell housing. The lower part of the bell housing being a separate casting, it is possible, to use a one piece oil pan that is easily removed without interfering with the flywheel housing.

For the force lubrication, the crankshaft is drilled with oil holes. It has three main bearings, of the following dimensions (front to the rear, diameter and length): $2\frac{1}{8} \times 3\frac{1}{2}$ in.; $2\frac{1}{4} \times 3\frac{1}{4}$ in. and $2\frac{3}{8} \times 4\frac{1}{2}$ in.

The shaft is drop forged from open hearth steel, machined and balanced in a static and dynamic balance machine. The rear end of the shaft is fitted with two oil throwers to prevent leakage at that point. A flange is, of course, fitted at the rear end of the shaft for the flywheel. The camshaft is forged from one piece of open hearth steel like the crankshaft and is case hardened. A flange is provided at the front end of the shaft to which the camshaft drive gear is bolted. The cams are exceptionally wide and are slightly off the center of the valve tappets to give that part a revolving motion.

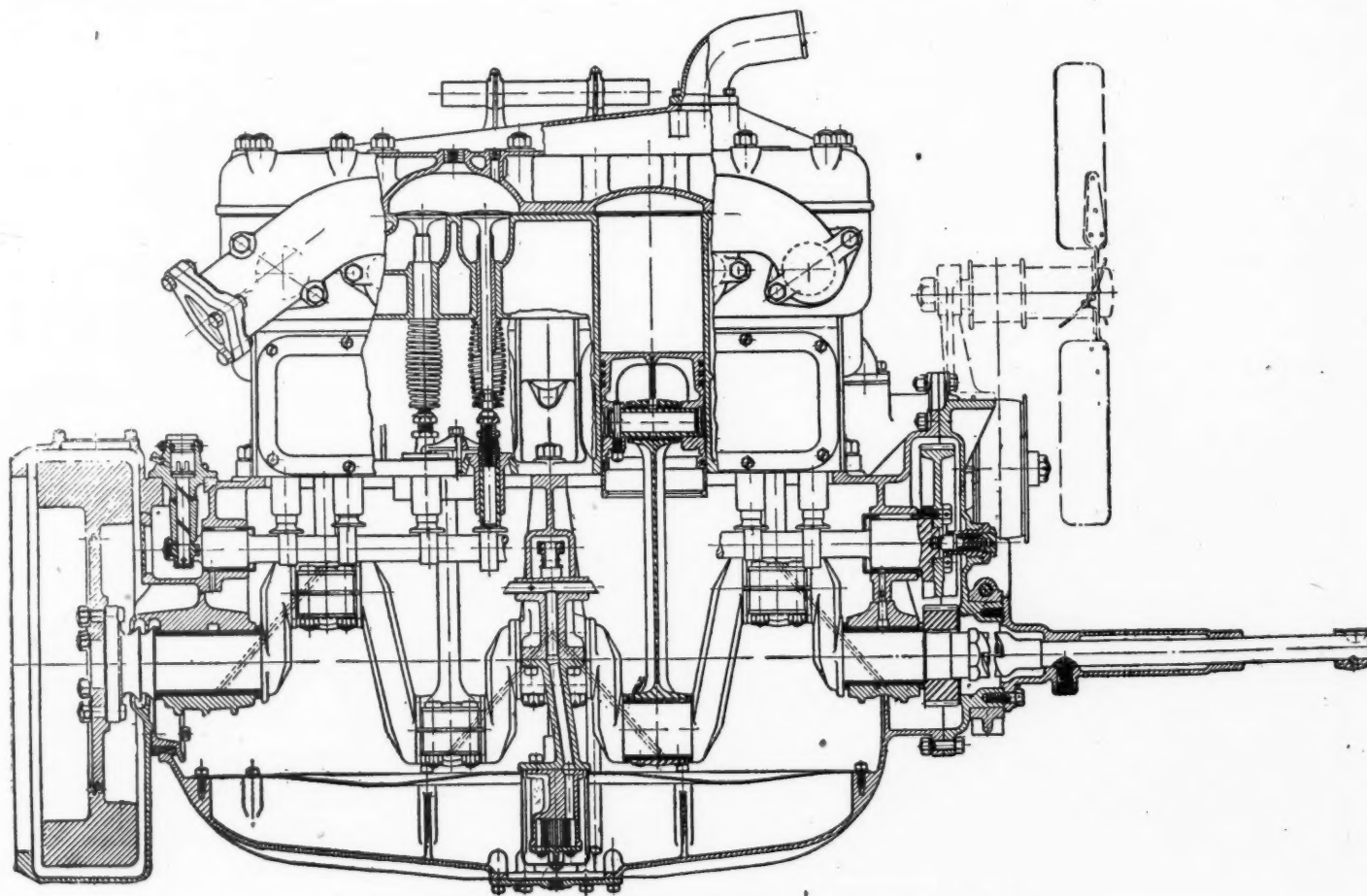
Use is made of I section connecting rods that are particularly heavy in construction. The crank end of the rod has a four bolt bearing cap, using $7/16$ in. studs. The lower bearing of the rods measures $2\frac{1}{4} \times 3$ in. and the piston pin bearing measures $1\frac{1}{4} \times 2\frac{1}{4}$ in. The rod length is $13\frac{3}{4}$ in., measured from center to center. This is a ratio of rod length to crank throw of 4.42 to 1.

The pistons are of gray iron and are fitted with three rings above the piston pin and one wiper ring below the pin. Cooling ribs are provided in the head of the piston to take care of the excessive heat due to long and continued use, especially in tractor work. Of special inter-

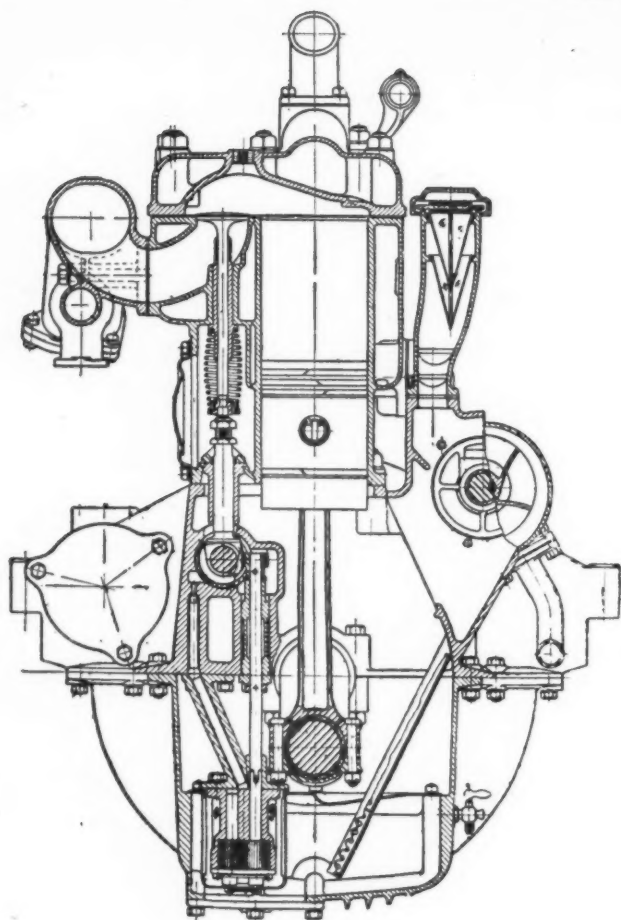


Distributor gears and oiling system

est is the balancing pad in the head of the piston which is a part of the piston and which gives a uniform position from which excess metal can be removed to balance the piston. The piston pins are securely locked in the piston boss by means of two locks, each independent of the other. First an expanding ring is fitted into a groove in the piston at each end of the piston pin. This serves to keep the pin from making contact with the cylinder wall should the pin become loose in the piston. The other lock is a stepped cap screw, which screws through the boss of the piston and through the pin. The step is pro-



Longitudinal section of the Buda Y T U truck and tractor engine



Cross section of engine

vided so that the mechanic, in disassembling the engine, can replace the screw through the pin in one direction only.

Lubrication and Cooling

Lubrication is by full pressure system. All crank bearings are lubricated through the hollow passage in the shaft. A geared pump, located in the lower part of the crankcase and secured to the upper half of the crankcase, is driven from the camshaft. Because the oil pump is secured as it is, it is possible to remove the bottom pan without in any way interfering with the pump. This arrangement also makes the pump accessible when the bottom oil pan is removed. The oil is first forced through a seamless steel supply main, from which leads are taken off to the bearings. The annular oil grooves at the bearing collect the oil and lead it in through the openings through the hollow shaft to the connecting rod bearings. From here it is thrown off, the spray lubricating the cylinder walls and pistons, as well as the piston pin. The timing gears also have their special high pressure lead.

The cooling system is of the forced circulation type, circulation being effected by a large bronze, closed vane centrifugal pump. Liberal sized and easily accessible packing glands are provided, and all parts coming in contact with the water are either bronze or

bronze covered. For example, the shaft has a bronze sleeve, shrink-fitted over it. The whole pump may be removed as a unit or separately, a provision that also applies to the drive unit for the pump. The fan pulley is driven from the pump shaft, the pulley being large, having a 2 in. face.

At the end of the pump shaft means are provided to drive a magneto and a base for the magneto is provided. If a battery ignition system is used, provision is made for the distributor drive in a vertical position mounted upon the water pump drive housing. The governor drive is mounted behind the rear cylinder and carries a vertical shaft driven by the camshaft. Provision for starting and lighting is also made and is in conformity with standards of the Society of Automotive Engineers.

Three point suspension is used, the rear supports being cast integral with the upper half of the crankcase. The forward support is mounted on a large trunnion bracket, arranged to seat upon the front cross member of the frame. Since each crankcase is common to two sets of cylinders, a larger engine may be used for the same truck chassis in case one type is to be used for solid tires and the other for pneumatic tires.

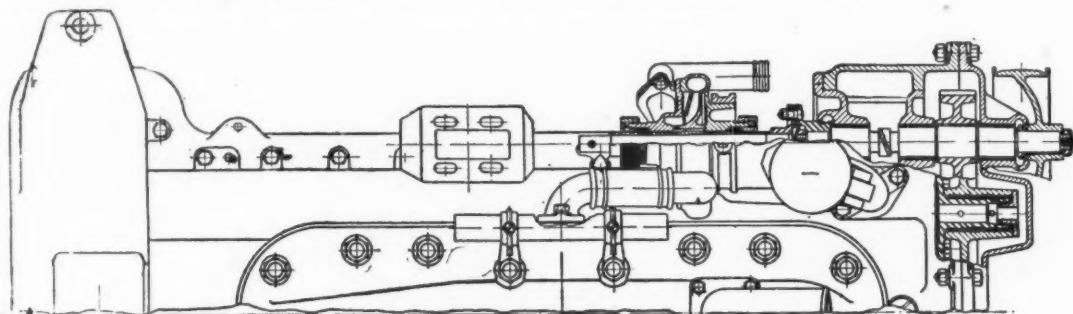
The Brussels Show

BRUSSELS will hold its first post-war automobile show Jan. 10 to 18 inclusive. For a long time the existence of the show was threatened, for the only suitable hall, the Palais du Cinquenaire, was not available. This building was used by the Germans, during the occupation, as a big repair depot for motor trucks, and was left by them full of war material. This was taken over by the Belgian army, which did not seem disposed to evacuate quickly.

Originally fixed for December, 1919, the date has been carried forward to January, 1920, and there seems absolute certainty that the show will be held. Many of the Belgian manufacturers who have not been able to exhibit at Paris or London, owing to lack of time for the building of cars, will present their new models at the Brussels show. So far as other Continental makers are concerned, Brussels merely will be a repetition of London and Paris.

BENJAMIN BRISCOE arrived in Paris on Oct. 3 from London by Handley Page airplane, to stay in the French capital until the end of the automobile show. At this exhibition there will be shown the first car built by Bellanger Freres of Paris to Briscoe designs. This car is an adaptation of American production methods to French ideas. The car has a four cylinder, 90x130 mm., detachable head engine, electric lighting and starting, center control, three speeds, and will be sold complete with six passenger body at \$3,500 at nominal rate of exchange.

The Bellanger Brothers also will produce, to their own designs, two high-class cars, one with eight and the other with four cylinders. The price of the eight-cylinder chassis is \$9,000 at nominal exchange.



Accessories drive of the new Buda engines

The Manufacture of Pistons in a Medium Sized Factory

This article is intended to show how it is possible in a plant making 50 engines daily to use the regular standard tools to advantage even on production work. It is, in a manner, a continuation or follow-up on Mr. Schipper's recent account of the making of connecting rods in the Hinkley factory

By J. Edward Schipper

PRODUCTION methods of the greatest value to the small factory are those allowing the greatest production with the least initial machinery investment. For instance, it would be absurd for a 50-per-day engine factory to buy a flywheel machine, costing \$25,000 to \$30,000, that would produce enough flywheels in an hour to last the shop for three weeks. This seems an exaggerated example but there are factories in which the machinery layout is so unbalanced.

A new machine should not be purchased that throws the production plan out of balance. If the machine is capable of producing parts for a great many more engines than the factory itself can produce in the same time, it is an excessive investment and will not pay. This is evident because it is natural that such a machine must remain idle for excessive lengths of time and an idle machine is a costly one.

Standard machinery, such as can be bought in the open market, is always the most economical for the small and medium sized factory. It is surprising what a little ingenuity will do towards converting such machinery into units capable of acting as real production machines.

The operations described herewith are those used in manufacturing pistons in the factory of the Hinkley Motors Corp. This is a plant with a normal production of 50 per day and a special effort has been made in laying out the machinery to have it attuned to this rate, with stock machinery used wherever possible. The photographs herewith show how the cutting tools and tables have been arranged to accommodate the machinery to specific jobs. There also are some kinks in handling pistons and in locating different operations that would be extremely useful in any piston department, regardless of the rate of production.



Fig. 1—Rough boring and squaring, or facing open end of piston

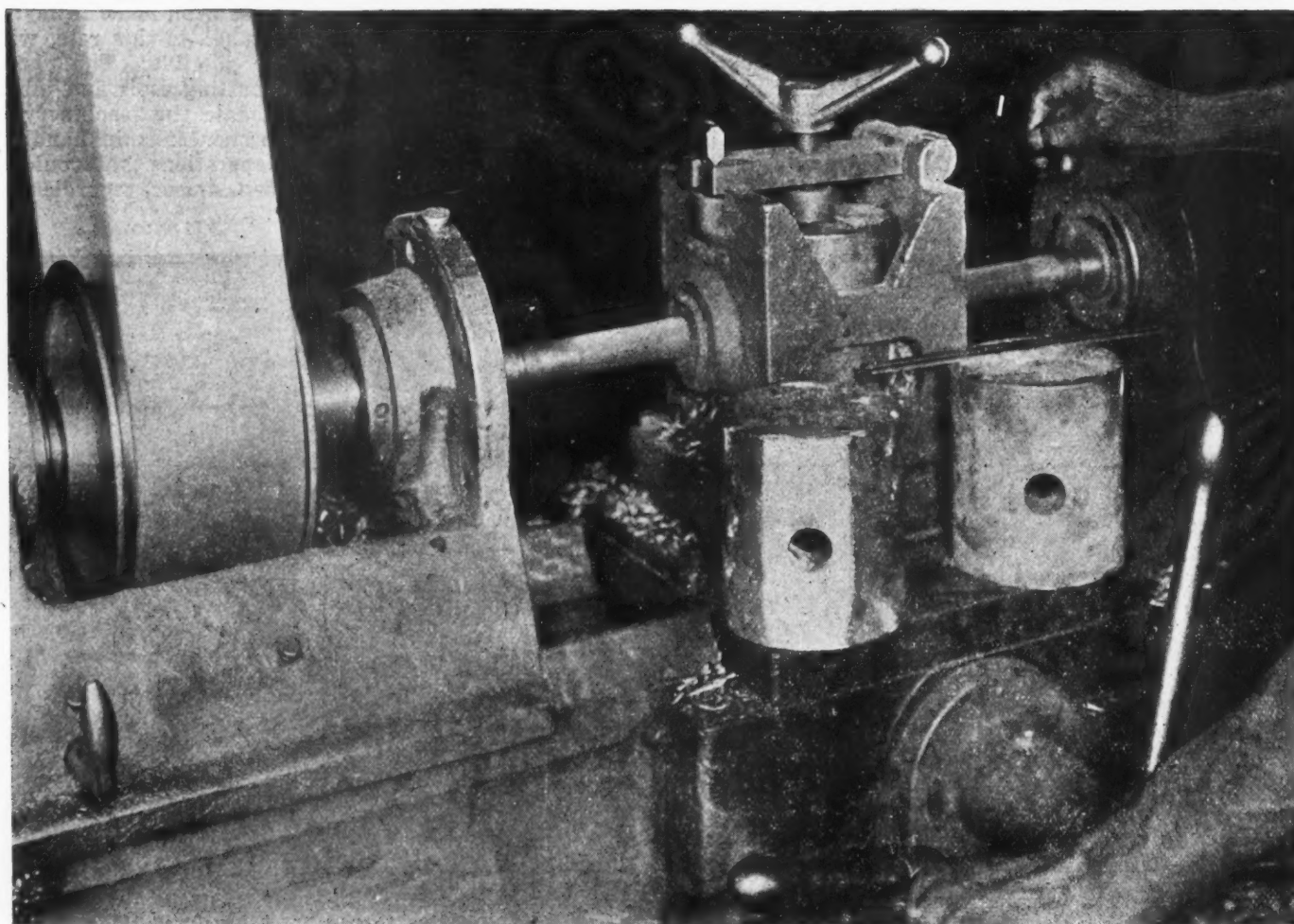
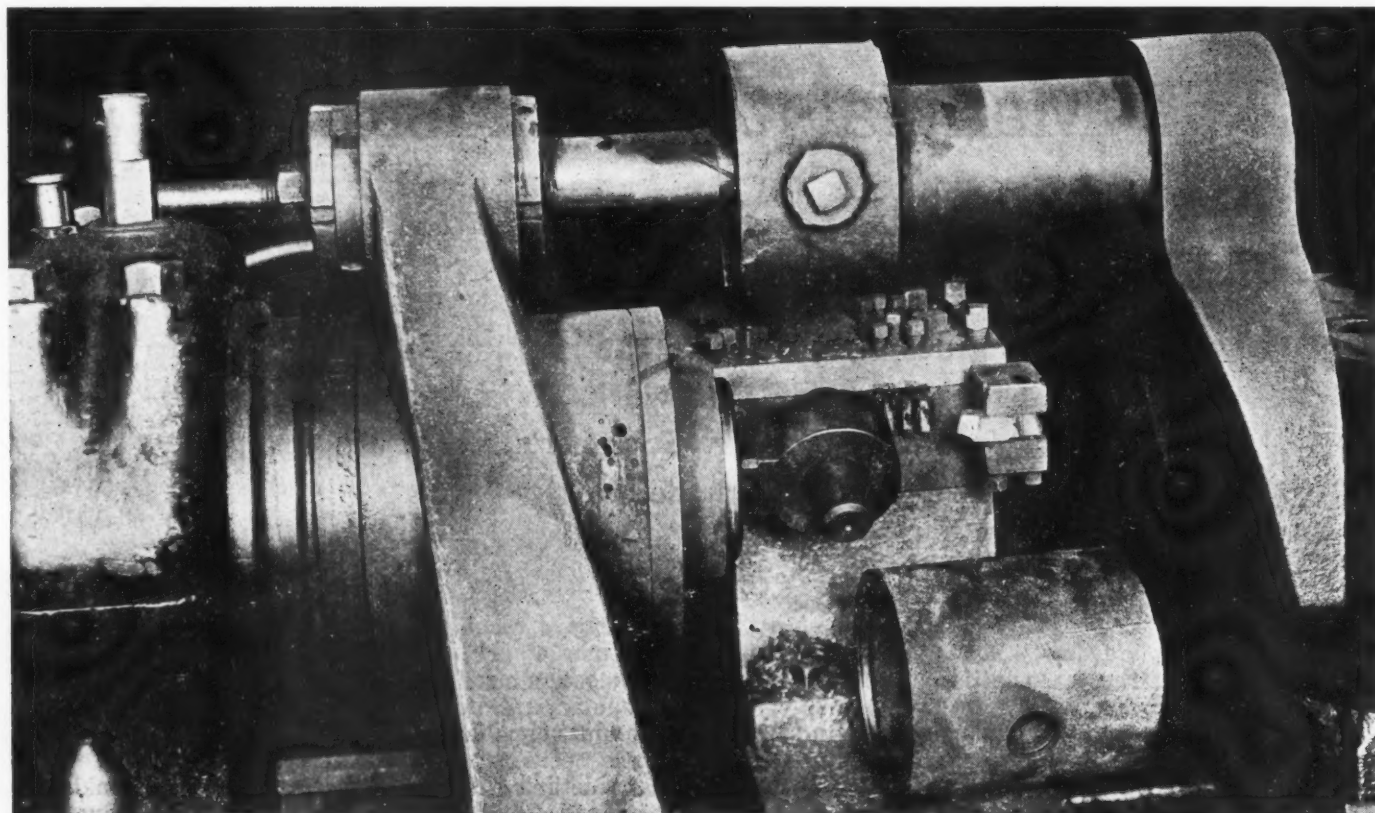


Fig. 2—Above—Cross drilling for piston pin holes, locating from piston pin bosses on V-blocks in fixture. Fig. 3—Below—Rough turning piston head and diameter, holding piston by drawbar through piston pin boss, drawbar being pulled back against open end, locating operators from inside of piston

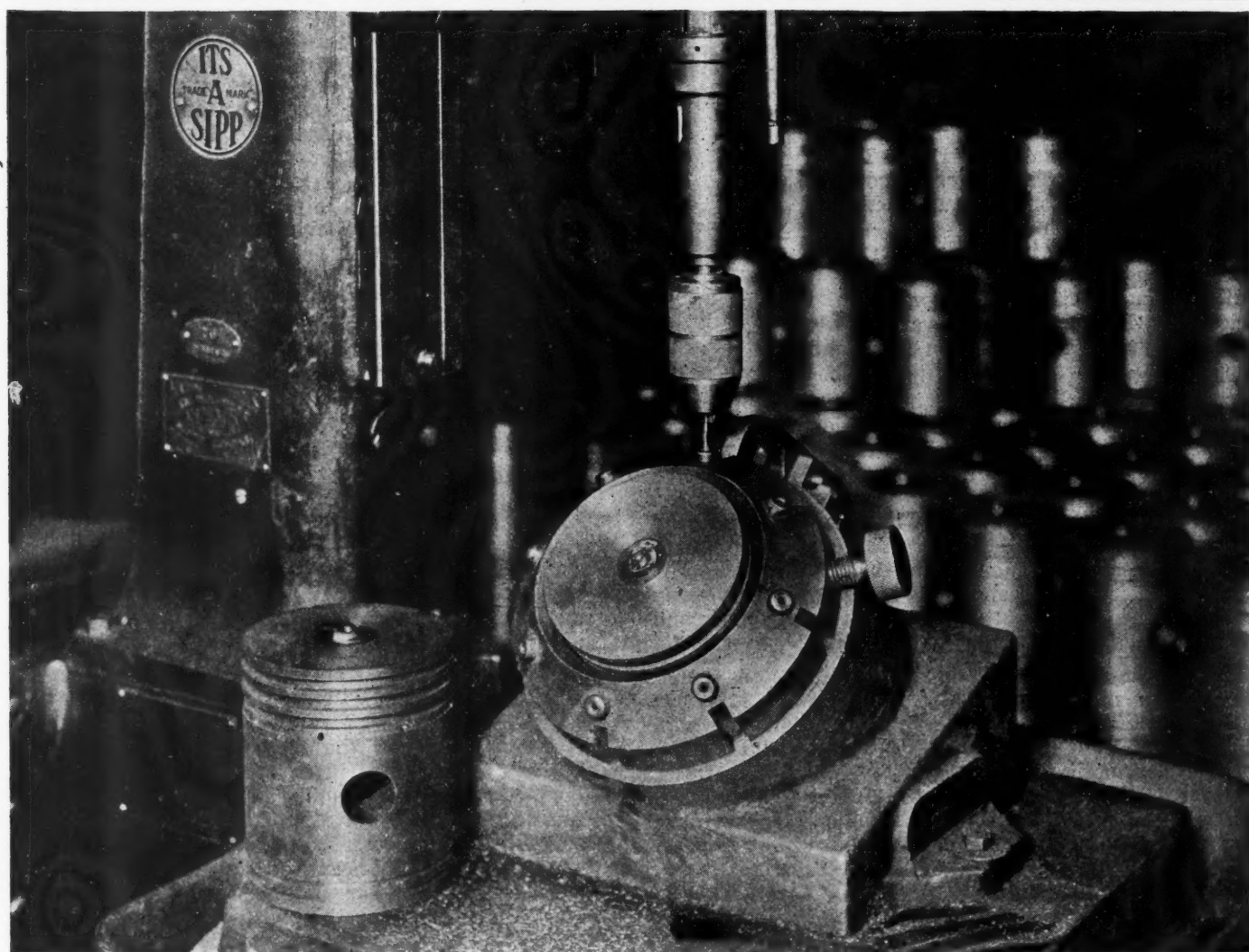
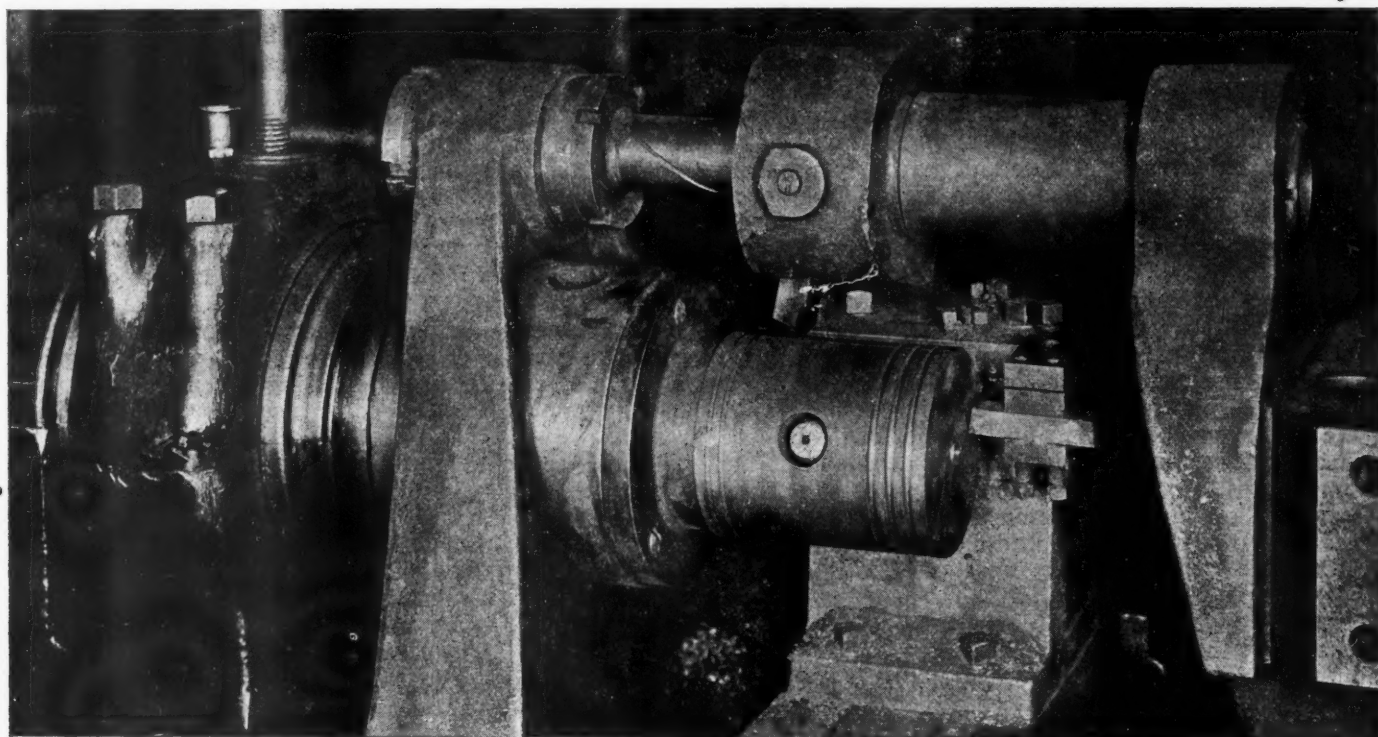


Fig. 4—Above—Finish turning and rough grooving heads. Fig. 5—Below—Drilling oil relief holes at 45 deg. on sensitive drill with indexing fixture

The principle upon which the pistons are manufactured is to use primarily interior locating points; that is, the pistons are lined up from the inside so as to assure the manufacturer that the outside surface of the cylindrical piston will be square with the axis of the piston pin. The first operation shown in photograph No. 1 carries out this locating scheme and gives a point from which to work. The machine shown faces off the open end of the piston and opens the end, or, in other words, turns it square with the facing. There is a small flange at the bottom end of the piston and this flange is bored out. This gives a point from which other operations may be accurately located.

The machine illustrated is an automatic chuck lathe, the chuck being operated by compressed air. It has a capacity of 40 pistons per hour. The inspection shown on the operation is checking up the end bore with the flat face surface for squareness at the open end of the piston, after the operation is completed.

Opening the end of the piston accurately and facing off the bottom end gives squareness one way and the next operation, that of drilling the piston pin bosses, gives the squareness in the transverse direction. To locate for the cross drilling for the piston pin holes, V-blocks are employed with notches into which the piston pin boss sets on the inside of the fixture. The piston comes down against these V-blocks so that the piston pin bosses rest in the V-shaped notches. The fixture is then clamped tight and both the bosses are drilled at once. This is a Garvin duplex drilling machine, with the fixture clamped to the carriage. The work is stationary. The fixture is shown in place in photograph No. 2.

The use of the inside location is clearly brought out in photograph No. 3, which shows the piston as it now stands ready for the exterior work, such as cutting the ring grooves, rough turning, etc.

The illustration shows the drawbar which holds the piston in place, with the flat end against a stop so designed as to fit within the piston and allow the bottom of the piston to rest against a shoulder. The drawbar is pulled back by a wheel-operated screw and a dummy piston pin fits through the end of the drawbar into the piston pin hole to hold the piston firmly in place while the head and diameter are rough-turned. This operation cannot fail to be accurate with such a method of location. The piston pin holes have been drilled squarely, as previously indicated, the bottom of the piston was faced square and the inside was accurately bored on the first operation.

Exactly the same method of holding the piston is used for finish-turning the piston, roughing out the groove and finish-turning the head. This operation shown in photograph No. 4 is accomplished also on a Potter & Johnson automatic piston machine. There are features, however, in the arrangement of the cutting tool, and particularly in the method of piloting the cutter, that have been developed in the Hinkley shops. It would be practically impossible to secure the desired accuracy without the heavy pilot that has been installed. Because of the length of the arm holding the cutter, some springing and consequent deflection of the cutting tools, or probably a chatter, would be almost certain to occur without such an arrangement. Note the spiral oil groove in the pilot. The two machines shown in photographs Nos. 3 and 4 are each capable of handling 100 pistons daily.

In addition to these more or less special operations, there are some ordinary turret lathe jobs. One has four operations that may be accomplished in the following working order:

- 1—Face and chamber open end.
- 2—Rough face piston pin lock screw boss.
- 3—Finish face piston pin lock screw boss.
- 4—Finish face, lower end.

Finished turning of the outside diameter is handled on an engine lathe. The drilling of the oil relief holes is shown in photograph No. 5. This work is done on a Sipp sensitive drill with an indexing fixture. There are eight $\frac{1}{8}$ in. holes to be drilled at 45 deg. The remaining operations are common to all piston practice, the finish-grinding of the outside diameter being accomplished in the usual way, an adapter being used for centering the pistons.

This adapter, of course, fits inside the pistons, as all the other holding devices do, in order to give the desired squareness to the finished job. The ring grooves are finished, cut and burnished on a machine in which the piston turns and the cutter is stationary. A 0.0001 in. tolerance is allowed on the ring groove. The piston pin holes are reamed, care being taken to hold the holes perfectly square with the outside surface. A compound tool is used for both rough and finish-reaming. The finish-reamed hole is held at 0.0003 in. for roundness and .00015 in. for concentricity. A special test for squareness is made by a plug gage with a dial attached, the dial being operated by a plunger which fits against the square surface of the piston, indicating any eccentricity of the hole. This test is shown in photograph No. 6.

The relieving operation for the piston pin boss is performed on a grinding wheel, the fixture again being located from the piston pin hole. In finishing up the pistons, burrs left by the burrisher on the ring grooves are taken off by a fine file and the piston dome is polished on emery and polishing wheels. A very complete set of gages is used for making a final test on all dimensions.



Finished Hinkley piston

Shale Development in Europe

SWEDEN is now taking up the question of developing her shale deposits, the scarcity of all petroleum derivatives during the war having been a great incentive. The quantity of shale contained in the alum-shale deposits of South Sweden is estimated at 5,250 million tons, which, assuming a crude-oil yield of 3 to 4 per cent, represents some 144,000,000 tons of crude mineral oil. Sweden's requirements, which now amount to about 25,000 tons of lubricating oil per annum, will probably therefore be covered for some years to come.

In Germany, prior to the outbreak of war, shale was worked in the Rhine provinces and near Reutlingen, but only one company was occupied in converting shale into kerosene and mineral oils. From the bituminous shale which occurs near Messel (and contains 40 to 45 per cent of water, 6 to 10 per cent of tar and 40 to 50 per cent residues) the following are obtained from 1 ton of shale: 36 gal. of crude oil, together with 78 gal. of ammonia water and 2,100 cu. ft. natural gas, which is burnt as fuel in gas engines or under the vertical retorts. During the war the oil-shale deposits in South and North Germany have been investigated as regards their yield, but the results have not yet been published.

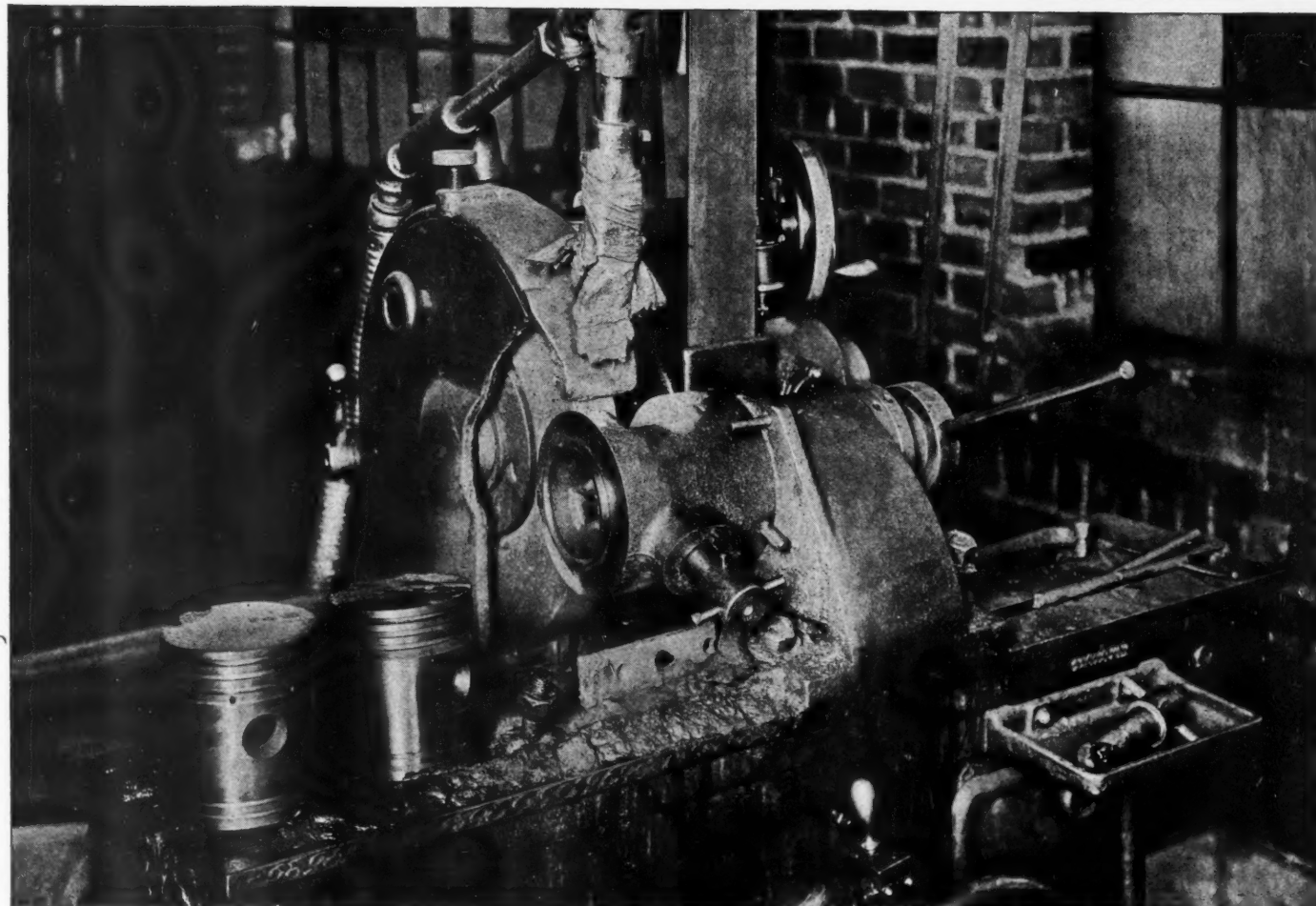


Fig. 6—Above—Inspecting for concentricity of piston pin hole. This is held to 0.00015 in. Fig. 7—Below—Relieving piston pin boss. This is a grinding operation with piston held and located from inside

Mechanical Details of the \$650 Samson Tractor

Here is the long expected Samson Model M tractor. The description is not as complete as we would like but is as complete as could be obtained at the Trenton, N. J., fair, where it was exhibited recently. No further details are to be given out for the present. It will not revolutionize tractor practice, but several novel and clever ideas have been incorporated.

IT has been known for a considerable time that the General Motors Co., at its Janesville, Wis., plant, was developing a tractor of the two-plow type to sell at a remarkably low price. This tractor, known as the Samson Model M, has recently been publicly exhibited for the first time. The regular price of the tractor is \$650 f. o. b. Janesville, Wis., an extra charge of \$50 being made for platform and fenders.

The design of this model is in line with the latest practice in farm tractor engineering. The engine is a 4-cylinder block type, with detachable heads, the top half of the crankcase being cast integral with the cylinder blocks. Kerosene is the fuel used in regular operation and the engine is provided with a combination inlet and exhaust manifold for its vaporization. This manifold has three outlets for the exhaust, one at each end and one in the center. The two end outlets are provided with butterfly valves, which are kept closed when the engine is first started up, thus causing all of the exhaust gases from the different cylinders to flow past the inlet manifold and quickly heat it up. After the engine has attained its regular working temperature, these valves are opened. Less heat is then imparted to the inlet manifold and there is consequently less loss of volumetric efficiency.

The fuel tank is of oval shape, mounted over the engine. At one end, there is a compartment for gasoline, which has a capacity of three gallons, while the capacity of the main compartment is 23 to 25 gal. There are two throttle valves in the inlet passage, one connected up to the hand control and the other to the governor. The crankcase is split horizontally, through the shaft axis, and the lower half is provided with a detachable base. The governor is of the centrifugal type mounted on the magneto drive shaft in front of the magneto drive gear housing.

A rather novel scheme is employed for mounting the magneto. It sets on a bracket similar to that used in truck practice but, instead of the base or bracket being bolted to the side of the crankcase, it is cast on a flange fitting which bolts against the rear side of the timing gear housing. A separate housing is used for the flywheel and clutch, which bolts to the crankcase. Provision is made in the design of the crankcase for mounting an electric starter. The front cover of the timing gear housing also forms a pad for supporting the radiator and a swivel joint for the front axle. The latter is of I section type and provided with Elliott type steering heads and knuckles. Two radius rods steady the front axle. The forward ends of these rods pass through holes in the web

of the axle, carrying nuts both behind and in front of the axle. The rear ends of the rods are swiveled on a cross bar supported at the bottom of the flywheel housing.

All air drawn in by the carbureter has to pass through an air filter to remove any dust and grit. This air filter is mounted on the side of the engine opposite from the carbureter, just below the overhanging fuel tank. The fuel tank is supported near its forward end on a bent strap secured on top of the engine and at its rear end by a Y bracket mounted on top of the flywheel housing. Both of these supports form a concave saddle for the tank, the latter being held in place by steel straps with screw ends. The filling openings for the two compartments of the tank are of large diameter, located near the rear.

Engine Cooling

Engine cooling is effected by the thermo-siphon system, there being large water connections between the engine and the radiator. There is no water piping, properly speaking, as both the engine and the radiator tanks are cast with inlet and outlet pipes, which are connected by short lengths of rubber hose. The radiator is of the flanged tubular type, with cast and bolted top and bottom tanks and cast side frames. The ignition control switch and the carbureter choker are located at the forward end on the right-hand side, where the operator can reach them while in position for cranking the engine.

The clutch used on the new model is of the metal disk in oil type and is enclosed within the flywheel. The first reduction of speed is effected by a spiral bevel gear set, which transmits the motion to a transverse splined shaft on which the sliding pinions are mounted. Two forward speeds are provided for, at speeds of $1\frac{3}{4}$ and 3 m. p. h. From the first transverse or splined shaft, the power is transmitted by spur gears to an intermediate shaft and thence by another pair of spur gears to the rear axle.

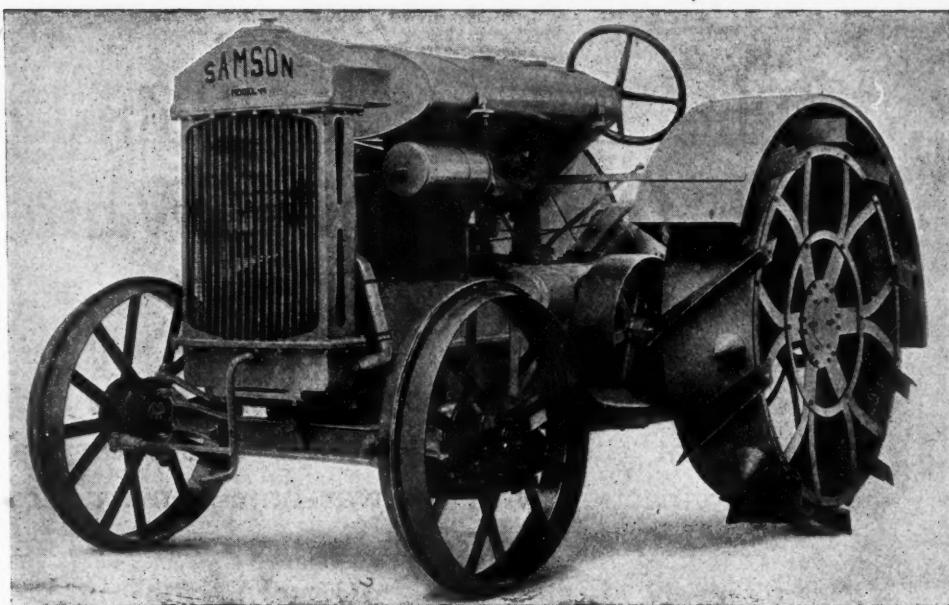
The tractor is of the backbone type, the transmission and rear axle housing being in one and bolted to the flywheel housing. The transmission and rear axle housing is split in a plane containing the axis of the rear axle and that of the intermediate shaft. A belt pulley of considerable diameter and moderate width is fitted to the splined shaft outside the transmission housing. This belt pulley also serves as a brake drum, a fabric-faced, spring-backed brake shoe being so arranged that, by means of a pedal convenient to the operator when in his seat, it can be applied against the interior surface of the pulley rim.

A single pedal serves to disengage the clutch and to apply the brake. This pedal is mounted on the left side of the transmission case and is of bell crank form, its rearwardly extending arm being of unusual length. The downwardly extending arm engages with the free end of a single armed lever, swiveled on a lug on the lever hub.

This single armed lever on a laterally extending arm carries the brake shoe. At a slight distance below the brake shoe arm, a set-screw passes through the shank of the lever, so located that, when the pedal is depressed and the single arm lever moves forward, the point of the set-screw will press against the top end of the clutch lever. Therefore, the first effect of depressing the clutch lever will be to disengage clutch and, if the motion is continued, the brake will be applied.

Steering is by means of a strongly inclined steering post fitted with an automobile type steering hand wheel with a cast four armed spider and wood rim. The steering motion is reduced by a bevel gear pinion and sector, the mechanism being supported by a bracket mounted on top of the flywheel housing. Another cast bracket on top of the transmission case extends upward and rearward and supports the steering post a short distance underneath the wheel. From the steering arm on the shaft of the bevel gear sector, connection is made directly by drag link to the right hand steering knuckle. Change of gear is effected by a ball-mounted, ball-ended lever, underneath and extending parallel with the steering column. This lever moves on a pressed steel sector, having abutments or shoulders against which the lever is pressed for any of the different positions. The gears to which the different positions correspond are indicated on the sector.

A wide lug is cast on the bottom of the rear axle housing, which serves as a drawbar hitch. Three holes are drilled through this lug side by side, permitting lateral adjustment of the hitch. The rear axle housing is heavily ribbed, and provided with circumferential flanges at both ends, to which axle tubes or trumpets are bolted. Two



Samson Model M tractor, with a sale price of \$650, has just been placed on market

finger levers are mounted on the side of the axle housing, for controlling the throttle and the exhaust heat.

An implement type of seat is fitted, mounted on a flat spring with bumper or safety spring beneath it, these springs being secured to the top of the axle housing. The gear reduction is such that, at 1,000 r. p. m. of the engine, the tractor travels at 3 m. p. h. Thirty-inch wheels are used in front, and 54 in. wheels in the rear. Both sets are of light construction. The front wheel rim is made up of two sections, with the two radial flanges side by side. The spokes are flat strips and are riveted to flanges turned on the wheel rim and cast on the hub. Hyatt roller bearings are used throughout the transmission and rear axle, there being two bearings on each side of the axle.

A wooden platform is supported by two channel steel bars bolted to lugs on the sides of the axle housing. Substantial fenders cover the rear wheels, supported by brackets bolted to the axle housing and extending down at the rear to the edge of the wooden platform. Platform and fenders are an extra and are not included in the regular price of the tractor.

The wheelbase is 71 in. and the tractor weighs, complete, 3200 lb.

American Trend at Paris Show

(Continued from page 752)

Because of the complaint that this type of suspension causes a car to roll when high speed is attained, the Lancia has produced a combination cantilever and semi-elliptic suspension. The rear end of the cantilever spring is attached to the axle by a short, heavy steel cable with conical steel ends. The semi-elliptic spring is a broad single leaf. There are no spring eyes on this car, the ends of the springs being drilled and bolted to special shackles which are readily changeable. Bellanger also has a system of spring attachment without spring eyes. The cantilever suspension entails the abandonment of Hotchkiss drive, and to avoid this the Unic has adopted double cantilevers, one above and the other below the axle.

The cone clutch has lost much ground.

Four-speed gearboxes are still in the majority, although on several high class, high powered cars only three speeds

are given. There is a strong tendency towards the use of helical gears for constant mesh pinions and also in some cases for the second gear.

The Hotchkiss drive has lost much ground. The Hispano-Suiza, one of the most prominent supporters of this drive, has abandoned it. The most popular drive system in the cars now on exhibition is the central type, with enclosed propeller shaft housing which terminates in the sphere received in the corresponding female member, either on the rear gearbox or on central cross frame member. This system is adopted by Fiat, Lancia, Bellanger, Peugeot, Farman and others. The worm drive is dead except in a few small cars which require a large gear reduction. It is not seen on any continental cars.

Wood wheels are in a small minority. Metal wheels of varied types are used on 80 per cent of the cars.

The Effects of Kiln-Drying On Commercial White Ash

Careful control of kiln conditions, using moderate temperatures and fairly high temperatures, will permit the successful drying of ash by artificial means. This article is a résumé of tests at the Forest Products Laboratory at Madison, Wis., in connection with the war-time construction program of the Air Service. Mr. Rosenthal presents facts and figures of value to every industry using such materials.

By H. J. Rosenthal*

BECAUSE of the lack of information on proper methods of kiln-drying material for airplane manufacture and in anticipation of the early exhaustion of stocks of air-dried material, the Forest Products Laboratory of the United States Forest Service, at Madison, Wis., secured a quantity of partially air-dried white ash and Sitka spruce and conducted a few preliminary experimental kiln runs using a range of temperatures and humidities. With the results of strength tests made on this material and the previous experience of the laboratory in many lines as a basis, general specifications (Signal Corps Specification 20,500-M—now, with some slight modification, Specification 20,500-A of the Air Service) for kiln-drying lumber were drawn up for use until more experimental kiln runs could be made for the Air Service of the Army and the Aircraft Division of the Bureau of Construction and Repair of the Navy to check the specifications and establish limiting conditions which were safe for each species.

The strength tests on the commercial white ash dried in the preliminary runs indicated that it could be successfully and safely kiln-dried by using moderate temperatures and fairly high humidities with careful control of kiln conditions. That material might be seriously damaged in strength properties without displaying visible signs of deterioration was also indicated. This showed that perfection of appearance did not constitute a safe criterion for the acceptance of material for exacting use, such as for longerons in aircraft construction, and emphasized the need of the standardizing of drying practice and the specifying of limiting conditions.

It is the purpose of this article to present such data on the kiln-drying and mechanical tests of green, air-dried and kiln-dried commercial white ash as are essential for determining the comparative effects of air and kiln-drying on strength properties and to present certain data on the suitability of kiln-drying as a process of preparing green stock for use in airplane manufacture.

There are many variables influencing the results of strength tests of wood, such as defects (knots, decay,

etc.), density, species, position in the tree, tree characteristics, moisture content and distribution, temperature at time of test, rate of loading and unaccounted variations—the last usually following the law of probability.

Since these factors have more or less to do with the strength properties, it is important to select material, conduct tests, and make analyses in such a manner that the kiln-drying process shall be neither charged nor credited with effects in reality due to some of these other influences. This can be done only by selecting for kiln-drying, material which is inherently like the green and the air-dried material with which it is to be compared, by bringing material to normal temperature before test, by making tests at standard rates of loading, by adjusting strength values for differences of moisture content at the time of test and by taking unaccounted variations into consideration in analyzing the data.

The commercial white ash used was derived from three different shipments. A shipment (L-499) of partially air-dried, 1½-inch rough planks sent to the laboratory by one of the airplane companies furnished material for the preliminary kiln runs (81, 82 and 83). A shipment (L-505) consisting of logs from 33 trees grown in South-eastern Arkansas furnished material for three runs (90, 96 and 97). Two kiln runs (92 and 100) were made upon material from a shipment (L-507) that consisted of logs from 50 trees grown near Goshen, Ind.

In order to have green, air-dried, and kiln-dried groups of material as inherently alike as possible, care was taken to cut material for the three groups from adjacent or similar locations in the same log. Fig. 1 is illustrative of the methods of cutting and marking. Material of one group was tested immediately in the green condition, of another after kiln-drying, and of the third after several months' storage under conditions particularly favorable to perfect air-drying.

Kiln-Drying

Kiln conditions (temperatures and relative humidities and average moisture content of samples of the stock) are shown for all the runs by the curves of Fig. 2. Runs 81 and 82 were made with high temperatures and low and moderate humidities, respectively, while run 83 was made with much lower temperatures than runs 81 and 82 and lower humidities than 82.

*Assistant Engineer in Forest Products, Forest Products Laboratory, U. S. Forest Service, Madison, Wis.

Note—The phrase "commercial white ash" is employed because the material used was not identified as to exact species but known to be of some of the species ordinarily sold as white ash.

Table 3—Efficiencies for Kiln Runs on White Ash

		Shipment L-505						Shipment L-507			
		K.R. 90		K.R. 96		K.R. 97		K.F. 92		K.R. 100	
Property	F ¹	E ²	ExF	E	ExF	E	ExF	E	ExF	E	ExF
Modulus of rupture....	2	88.1	176.2	101.1	2.02	97.7	195.4	97.0	194.0	97.7	195.4
Modulus of elasticity..	4	93.5	374.0	103.8	415.2	107.9	431.6	100.0	400.0	103.1	412.4
Work	3	101.1	303.3	112.8	338.4	110.0	330.0	112.1	336.3	107.9	323.7
Drop	3	119.2	357.6	102.7	308.1	101.1	303.3	113.6	340.8	104.1	312.3
Compression parallel..	2	80.0	160.0	100.0	200.0	96.2	192.4	95.3	190.6	94.8	189.6
ExF .....	..	.....	1,371.1	.....	1,463.9	.....	1,452.7	.....	1,461.7	.....	1,433.4
ExF											
<hr/>											
F											
weighted average E..	..	.....	98.0	.....	104.6	.....	103.8	.....	104.4	.....	102.4
E .....	..	481.9	.....	520.0	.....	512.9	.....	518.0	.....	507.6	.....
E											
average E.....	..	96.4	.....	104.1	.....	102.6	.....	103.6	.....	101.5	.....
5											

¹F = weighting factor.²E = efficiency = improvement ratio for property of kiln-dry. Improvement ratio of same property of corresponding air-dry.

Run 90 was made with an initial temperature of 120° F. and a relative humidity of 80 per cent, the final temperature being of 150° F. and the relative humidity 30 per cent. This is approximately according to Table 1 of the Bureau of Aircraft Production Specification 20,500-A. Run 96 was a low temperature (120 to 130° F.) and a high relative-humidity run, while run 97 had the same initial temperature of 120° F., but a final temperature of 140° F., the relative humidities ranging from 80 per cent initial to 47 per cent final. Run 92 had temperatures ranging from 120° F. to 130° F., and humidities from 80 to 60 per cent; while run 100 was made with low temperatures (100 to 120° F.) and with relative humidities ranging from 90 to 40 per cent.

Steaming was used to relieve case-hardening in several runs (82, 83 and 90) and is indicated on the diagrams of Fig. 3 by a sudden high humidity held for a short time near the end of the run. Initial steaming was used in runs 90, 92 and 96.

All standard tests were made on green, air-dried and kiln-dried material, but, since all experiments were made with reference to airplane production, only the five mechanical properties representing qualities most desirable in airplane woods were used in analyzing the data. They are modulus of rupture; modulus of elasticity; and work to maximum load, in static bending; height of drop in impact bending, and maximum crushing strength in compression parallel to grain.

Kiln-drying for airplane stock is intended to replace a long process of air-seasoning. Consequently, the strength of air-dried material is the standard by which that of kiln-dried material must be judged.

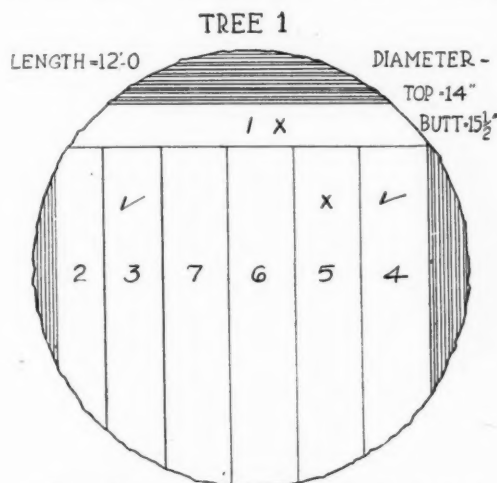
Comparative Strength Data

Average strength values for the various groups of green, air-dried and kiln-dried material are given in Table 1. Direct and indiscriminate comparisons from this table are subject to two major difficulties:

1. Values presented in the various columns of the table are derived from groups of material which differ because obtained from different localities, from different trees or from different parts of trees. Groups of columns, such as 1 and 2; 8, 9 and 10; 14, 15 and 16, etc., are as strictly comparable as the careful selection of test material can make them. Except for the preliminary kiln runs, all comparisons are made within such groups.

It has been found that the change in properties produced by drying is, in general, somewhat less variable than the actual values of these properties after drying. One step towards lessening the uncertainties of compari-

sons between various groups is, then, to compare kiln- and air-dried material on the basis of changes that have resulted from drying rather than on the basis of such figures as are given in Table 1. The measure of this

x Tested green
and air dry

✓ Kiln dried

Piece 1

1-5-A ✓	1-5-B (x)	1-5-C ✓
1-4-A ✓	1-4-B (x)	1-4-C ✓
1-3-A (x)	1-3-B ✓	1-3-C (S)
1-2-A (S)	1-2-B ✓	1-2-C (x)
1-1-A (x)	1-1-B (S)	1-1-C (S)

Piece 3

3-1-C (x)	B (S)	A (x)
3-2-C (S)	B (x)	A (S)
3-3-C (x)	B (S)	A (x)

Piece 4

4-3-C (S)	B (cull) (x)	A (S)
4-1-C (x)	B (cull) (S)	A (x)

Piece 5

5-3-A ✓	5-3-B (S)	5-3-C ✓
5-2-A ✓	5-2-B (x)	5-2-C ✓
5-1-A S	5-1-B ✓	5-1-C (x)

PIECES MARKED (x) TESTED AFTER AIR DRYING

REMAING STICKS TESTED GREEN

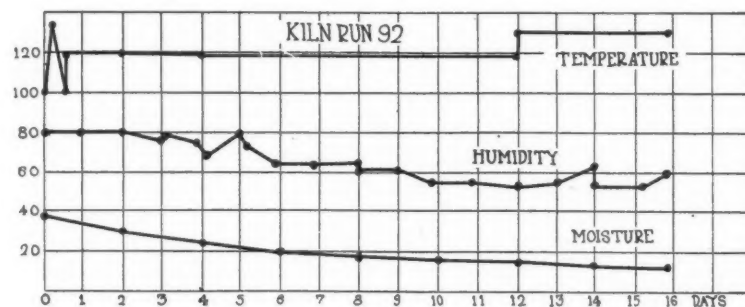
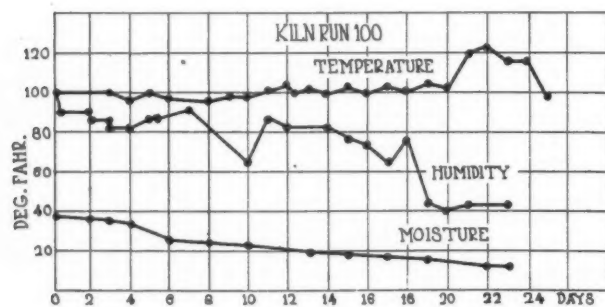
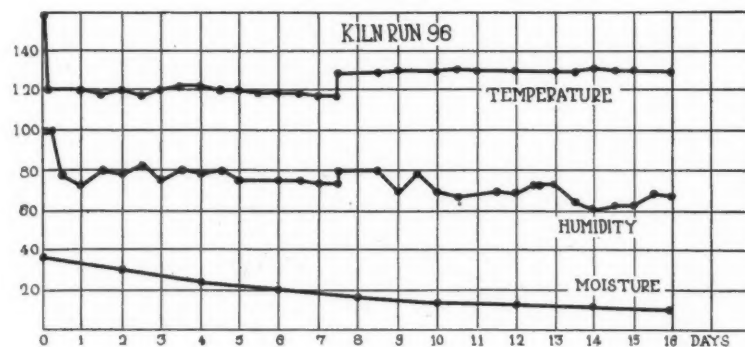
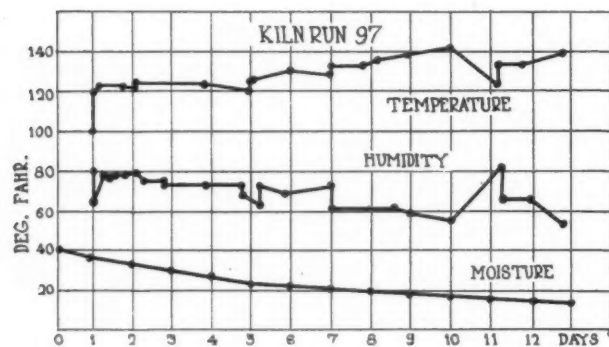
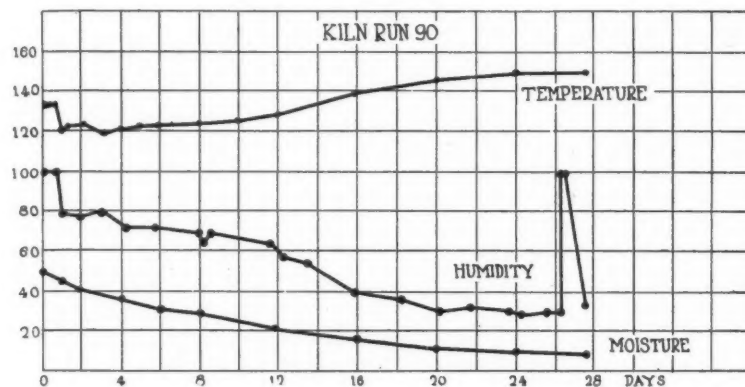
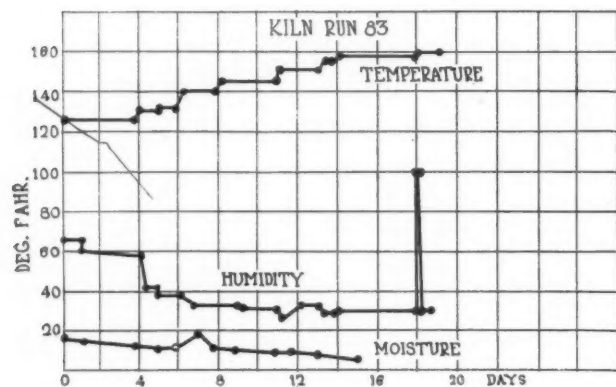
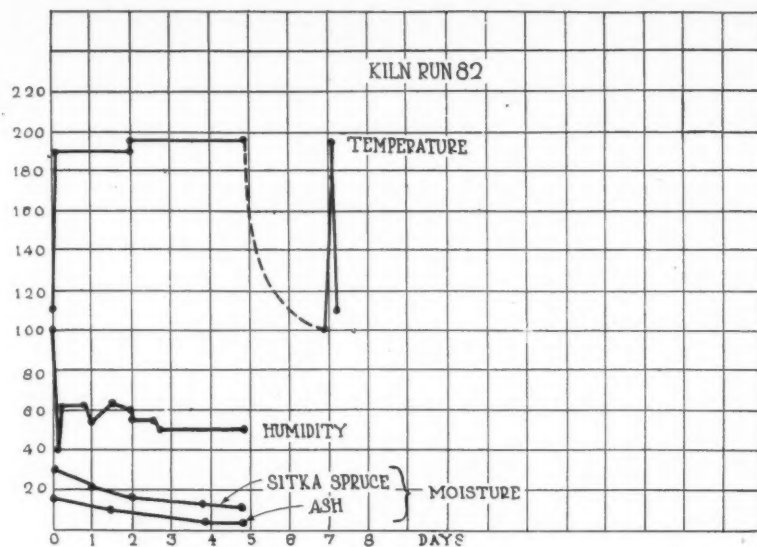
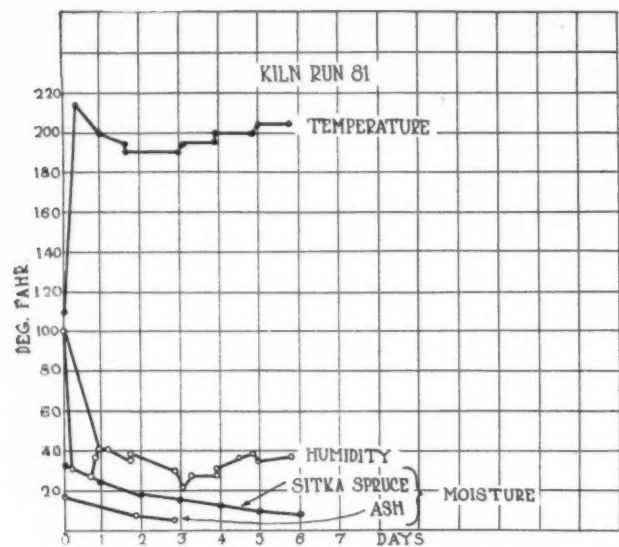
(x) IMPACT BENDING } TESTED GREEN-PIECE 1
(S) STATIC BENDING }

PIECE 3 TESTED FROM K.R. 92

PIECE 4 TESTED FROM K.R. 100

(x) IMPACT BENDING } PIECE 4
(S) STATIC BENDING }

Fig. 1



(Fig. 2)

change is called an improvement ratio. Improvement ratio—

$$\frac{\text{strength property of kiln (or air) dried material}}{\text{same strength property of corresponding green material}}$$

2. The several columns of data on dry material are the results of tests made at slightly differing percentages of moisture content, as shown. Now, when material is at this stage of dryness (5 to 13 per cent moisture), small differences in moisture content cause rather large differences in strength. In order to render data more comparable, it is essential to take cognizance of this and make adjustment for differences of moisture content.

Overcoming Obstacles to Comparisons

The steps, then, toward overcoming the obstacles to direct comparisons from such data as those contained in Table 1 are: First to take improvement ratios and then to adjust the improvement ratios to some moisture percentage selected as standard. In this case, the standard was 10 per cent. Improvement ratios before and after such adjustments are given in Table 2. The adjusted ratios are graphed in Fig. 3. It is well to realize that comparisons within the "matched groups" of Fig. 3 (air-dried matching kiln run 97 compared with kiln run 97, for instance) are exactly the same as they would be if strength properties instead of improvement ratios were adjusted for moisture and plotted.

Figures on efficiencies of various kiln runs are presented in Table 3. Taken with its footnotes, the table is self-explanatory. The weighting factors assigned to the various properties are approximately in accordance with the relative importance of these properties in airplane material.

The absence of complete data, that is, data from tests of green and air-dry stock matching the kiln-dried material, necessitates that runs 81, 82 and 83 be judged by comparing the improvement produced in them with that produced by air-drying in other groups. Such comparisons show that 83 is normal or above normal in all respects, while 81 and 82 are quite low in work to maximum load, and 82 is very low in drop. (See Table 2 and Fig. 3.) It is concluded that 83 has, in all probability, produced as good results as would be secured

from air-drying, but that 81 and 82 have failed to give good results in work and drop values that are measures of shock-absorbing ability and of great importance in airplane material. Study of Tables 1, 2 and 3 of Fig. 3 shows that runs 90, 96, 97, 92 and 100 are all fully equal to the corresponding air-dried material in the important properties, work to maximum load and drop; that all except 90 are equal or superior to air-dried material in modulus of elasticity, and that 96 only is fully equal to the air-dried material in modulus of rupture and maximum crushing strength. Furthermore, run 90 falls very considerably below air-dried material in these latter properties.

It is notable that the properties giving the lower efficiencies, that is, modulus of rupture and maximum crushing strength, are those in which the improvement by drying is higher, and the run (90) giving the lowest efficiencies in these properties is the one in which the moisture content of the air-dried material differs most from that of the kiln-dried. Moisture adjustments are least accurate for the properties largely affected by changes of moisture content and when comparatively large differences of moisture must be adjusted for. Consequently, it is probable that the apparent low efficiencies mentioned above are, to a considerable extent, due to these causes and are not particularly significant.

Conclusions

Runs 81 and 82, made on partially air-dried material at high temperatures (180 to 210° F.) and with compara-

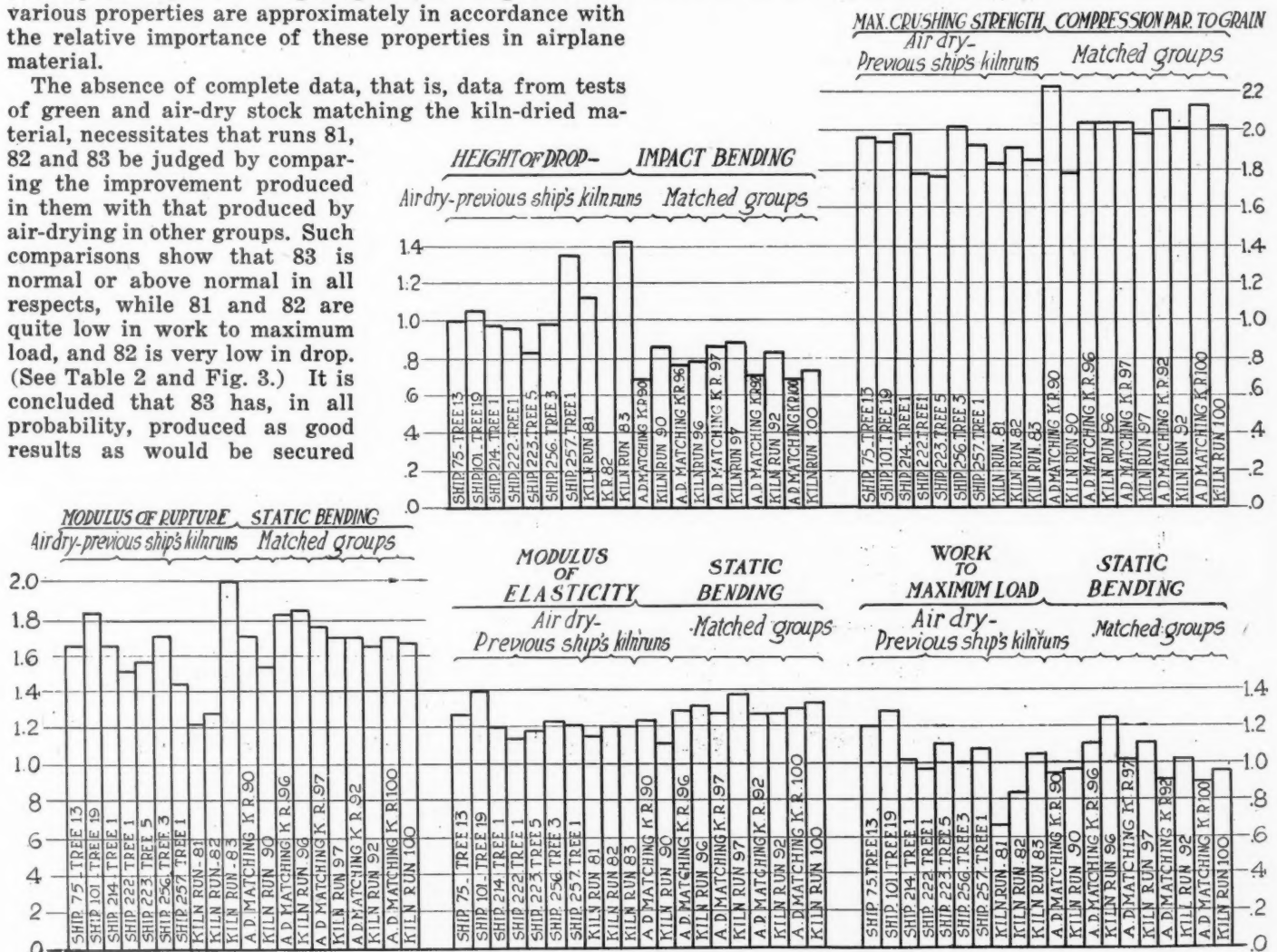


Table 1—Mechanical Properties of Commercial White Ash
(SUMMARIES OF ORIGINAL TEST VALUES)

VARI- OUS SHIPMENTS	SHIPMENT 499				SHIPMENT 505				SHIPMENT 507			
	Par- tially Air-Dry Match- ing Kiln Run 81-82	Kiln Run 81	Kiln Run 82	Air-Dry Match- ing Kiln Run 83	Kiln Run 83	Green Match- ing Kiln Run 90	Air-Dry Match- ing Kiln Run 90	Green Match- ing Kiln Run 96	Air-Dry Match- ing Kiln Run 96	Kiln Run 96	Green Match- ing Kiln Run 97	Air-Dry Match- ing Kiln Run 97
Tree 13 Ship. 75	8.9	15.0	4.4	7.2	12.6	45.1	12.9	42.4	13.0	12.2	42.1	13.0
Tree 19 Ship. 101	0.587	0.588	0.578	0.602	0.568	0.534	0.574	0.519	0.577	0.566	0.525	0.579
Tree 1 Ship. 214	11.060	6.260	9.360	9.300	7.280	5.460	8.320	4.910	7.720	7.640	6.110	7.870
Tree 1 Ship. 222	10.060	10.940	13.460	14.250	12.440	8.940	12.970	8.520	12.940	13.780	8.820	12.850
Tree 5 Ship. 223	1.900	1.437	2.639	2.977	1.569	1.349	1.563	1.266	1.502	1.583	1.452	1.729
Tree 3 Ship. 256	3.64	1.35	2.62	2.97	1.93	1.30	2.49	1.10	2.17	2.10	1.17	2.24
Tree 1 Ship. 257	13.4	13.4	8.24	11.2	13.3	13.0	12.51	12.20	13.0	14.45	12.75	12.77
Green	30.3	21.0	11.9	18.3	23.2	13.0	12.51	12.20	13.0	41.6	12.75	12.77
Moisture—Per cent.	41.0	15.0	4.4	7.2	12.6	45.1	12.9	42.4	13.0	12.2	42.1	13.0
Specific Gravity—Volume as Tested	0.54	0.588	0.578	0.602	0.568	0.534	0.574	0.519	0.577	0.566	0.525	0.579
Fibre Stress at E. L.—Pounds per square inch.	5,750	6,260	9,360	9,300	7,280	5,460	8,320	4,910	7,720	7,640	6,110	7,870
Modulus of Rupture—Pounds per square inch.	10,050	10,940	13,460	14,250	12,440	8,940	12,970	8,520	12,940	13,780	8,820	12,850
Modulus of Elasticity—1,000 pounds per square inch.	1,509	1,437	2,639	2,977	1,569	1,349	1,563	1,266	1,502	1,583	1,452	1,729
Work to E. L.—Inch—Pounds per cubic inch.	1.26	1.35	2.62	2.97	1.93	1.30	2.49	1.10	2.17	2.10	1.17	2.24
Work to Max. Load—Inch—Pounds per cubic inch.	14.29	13.4	8.24	11.2	13.3	13.0	12.51	12.20	13.0	14.45	12.75	12.77
Work, Total—Inch—Pounds per cubic inch.	40.29	21.0	11.9	18.3	23.2	13.0	12.51	12.20	13.0	41.6	12.75	12.77
IMPACT BENDING—60 Pound Hammer												
Moisture—Per cent.	41.0	15.0	4.4	7.2	12.6	45.1	12.9	42.4	13.0	12.2	42.1	13.0
Specific Gravity—Volume as Tested	0.54	0.588	0.578	0.602	0.568	0.534	0.574	0.519	0.577	0.566	0.525	0.579
Fibre Stress at E. L.—Pounds per square inch.	5,750	6,260	9,360	9,300	7,280	5,460	8,320	4,910	7,720	7,640	6,110	7,870
Modulus of Elasticity—1,000 pounds per square inch.	1,509	1,437	2,639	2,977	1,569	1,349	1,563	1,266	1,502	1,583	1,452	1,729
Work to E. L.—Inch—Pounds per cubic inch.	1.26	1.35	2.62	2.97	1.93	1.30	2.49	1.10	2.17	2.10	1.17	2.24
Drop causing complete failure—Inches.	38.7	32.4	37.8	10.1	38.0	43.1	34.1	43.6	36.4	35.8	40.6	36.7
COMPRESSION PARALLEL TO GRAIN												
Moisture—Per cent.	41.0	15.0	4.4	7.2	12.6	45.1	12.9	42.4	13.0	12.2	42.1	13.0
Specific Gravity—Volume as Tested	0.54	0.588	0.578	0.602	0.568	0.534	0.574	0.519	0.577	0.566	0.525	0.579
Maximum Crushing Strength—Pounds per square inch.	4,310	4,650	9,380	8,380	9,530	3,730	6,800	3,780	6,260	6,660	3,780	6,260

Ship. 256—white ash (Fraxinus americana) grown in Pocatongo Co., W. Virginia.
Ship. 257—white ash (Fraxinus americana) grown in Overton Co., Tennessee.
Test specimens of Shipment 499 were 125 in. x 125 in.
Values of Drop of Shipment 499 adjusted to 2 in. x 2 in. sticks.

Ship. 75—green ash (Fraxinus lanceolata) grown in Richland Parish, Louisiana.
Ship. 101—white ash (Fraxinus americana) grown in Stone Co., Arkansas.
Ship. 214—white ash (Fraxinus americana) grown in Oswego Co., New York.
Ship. 222—blue ash (Fraxinus quadraculata) grown in Bourbon Co., Kentucky.
Ship. 223—green ash (Fraxinus lanceolata) grown in New Madrid Co., Missouri.

tively low humidities, resulted in rather severe damage to the improvement properties of work to maximum load and drop.

Neither of these runs, however, produced any visible damage.

Run 83 on partially air-dried material, and runs 90, 96, 97, 92 and 100 on green material, at more moderate temperatures (initial 100 to 125° F., and maximum 120 to 160° F.), and with somewhat higher humidities, have all produced material practically equal in mechanical properties to air-dried material.

The results of this latter group of kiln runs furnish no basis for co-ordination between severity of kiln conditions and the mechanical value of the product.

From 2 and 3 above, the conclusion follows that the ensuing schedule is safe for the drying of white ash.

Stage of drying	Drying Conditions	
	Max- imum tem- pera- ture Deg. F.	Mini- mum rela- tive humid- ity Per cent
Beginning	120	80
25 per cent moisture (fiber saturation point).	125	70
20 per cent moisture....	128	60
15 per cent moisture....	138	44
12 per cent moisture....	142	38
8 per cent moisture....	145	33
Final	145	33

(The remaining table to complete this article is printed on the following page.)

THE question has often been asked whether just as good Babbitt metal can be made from scrap metals as from new metals. According to Alfred A. Green, who recently read a paper on the subject, good Babbitt metals can be made from scrap metals, but if the same formula is used, the scrape metal alloy is not as good as one made from new metals. The alloy made from scrap metals may do the work satisfactorily, because of the usual factor of safety, but although sold at a lower price, it is not necessarily cheaper. This is due to the fact that every time metals are melted, a certain amount of oxidation takes place. If scrap metals are used, the oxides are present, and in the ordinary shop practice they cannot all be eliminated. These oxides come to the top when the metal is melted, and are skimmed off in the form of dross. This means that one does not get as many pounds of metal in the bearings when made from scrap metals, as one would if the alloy were made from new metals.

Table 2—Commercial White Ash

Improvement ratios with and without adjustment to 10 per cent moisture of kiln and air dry material

Ship- ment	Seasoning	Moisture Per cent	Modulus of Rupture		Static Bending— Modulus of Elasticity		Work to Maximum Load		Impact Bending— Height of Maximum Drop		Compression Parallel to grain Maximum Crushing Strength			
			I. R. as tested	I. R. ad- justed	I. R. as tested	I. R. ad- justed	I. R. as tested	I. R. ad- justed	I. R. as tested	I. R. ad- justed	I. R. as tested	I. R. ad- justed		
75	Air dry	11.4	1.54	1.65	1.22	1.26	1.18	1.21	11.3	1.00	1.00	11.2	1.81	1.96
101	Air dry	10.4	1.78	1.83	1.37	1.39	1.26	1.27	10.8	1.04	1.035	10.5	1.87	1.93
214	Air dry	9.0	1.73	1.65	1.22	1.20	1.04	1.035	9.0	0.98	0.98	9.5	2.04	1.97
222	Air dry	9.7	1.53	1.51	1.15	1.14	0.97	0.97	9.3	0.97	0.97	9.6	1.85	1.77
223	Air dry	9.5	1.61	1.57	1.20	1.19	1.12	1.11	9.3	0.82	0.83	9.6	1.80	1.76
256	Air dry	7.0	1.92	1.65	1.31	1.23	0.98	0.985	6.2	0.98	0.99	6.9	2.50	2.01
257	Air dry	5.6	1.68	1.43	1.32	1.21	1.01	1.08	5.2	1.55	1.35	5.4	2.60	1.92
*499	Kiln run 81	4.4	1.23	1.20	1.18	1.16	0.62	0.66	4.8	1.17	1.14	4.7	2.02	1.82
*499	Kiln run 82	7.2	1.30	1.35	1.17	1.20	0.84	0.82	7.2	0.31	0.30	7.4	1.80	1.91
*499	Kiln run 83	6.2	1.56	2.00	1.12	1.20	1.03	1.05	5.9	1.30	1.42	6.8	1.35	1.85
505	Kiln run 90	8.9	1.56	1.49	1.197	1.15	0.94	0.95	8.8	0.84	0.86	9.0	1.88	1.78
505	Air dry	12.9	1.45	1.69	1.16	1.23	0.96	0.94	12.8	0.79	0.72	12.5	1.82	2.22
505	Kiln run 96	12.2	1.62	1.85	1.25	1.33	1.18	1.24	11.9	0.82	0.78	12.0	1.77	2.05
505	Air dry	13.0	1.52	1.83	1.19	1.28	1.07	1.10	13.4	0.835	0.76	12.9	1.66	2.05
505	Kiln run 97	12.9	1.46	1.70	1.25	1.37	1.07	1.10	11.9	0.89	0.87	12.6	1.65	1.97
505	Air dry	13.0	1.47	1.74	1.18	1.27	1.00	1.00	13.2	0.90	0.86	12.9	1.66	2.05
507	Kiln run 92	11.0	1.57	1.65	1.24	1.27	1.01	1.01	11.1	0.85	0.83	11.0	1.87	2.00
507	Air dry	12.7	1.47	1.70	1.19	1.27	0.93	0.90	12.6	0.79	0.73	12.8	1.71	2.10
507	Kiln run 100	11.3	1.56	1.67	1.28	1.33	0.97	0.96	11.2	0.78	0.75	11.0	1.87	2.01
507	Air dry	12.6	1.48	1.70	1.21	1.29	0.915	0.89	12.7	0.79	0.72	12.8	1.72	2.12

Fiber saturation point = 20 per cent moisture.

* I. R. as tested = $\frac{K. D.}{A. D.}$ (no green to match).

Utilization of the Power of Supercharge Engines

If it is made possible by means of superchargers to obtain the same power from aircraft engines at high altitudes as at ground level, the next problem is how to design the propeller so as to be capable under all conditions of absorbing this power. Lieut.-Col. Dorand, in a recent article in *L'Auophile*, considers the problem of adapting the propeller to the increased power of supercharge engines at high altitudes. From data derived from full scale tests on a Breguet machine at altitudes up to its ceiling, he calculates the new diameter and pitch of propeller required for the full utilization of the increased power. He shows that the velocity of translation, the diameter and the ratio of pitch to diameter of the propeller go on increasing up to the new ceiling, as also does the efficiency of the propeller. The figures are as follows:

Test of the Breguet machine with ordinary engine all out, flying horizontally at five different altitudes:

Altitude (feet)	Velocities m. p. h.	Diameter of propeller (ft.)	Pitch of propeller (ft.)
3,280	110	—	—
6,560	108	—	—
9,840	106	9.64	6.29
13,120	101	—	—
Ceiling 16,400	96	—	—

Calculations from these data for the same machine fitted with a motor having the same power and the same r. p. m. at all altitudes as the original at the ground, and flying horizontally at the respective altitudes in the five tests indicated above:

Altitude	Velocity	Diameter of propeller	Ratio of pitch to diameter	Efficiency of propeller %
12,500	129	10.2	0.79	75.5
22,800	146	0.75	0.875	76.2
32,800	156	11.3	0.935	77.0
42,600	175	11.9	1.025	78.2
Ceiling 54,200	194	12.7	1.118	80

If a propeller be selected for best performance at some high deg. altitude with the constant power motor, climbing will be slow if not impossible at first until the designed altitude is reached, while above this altitude the

motor cannot be employed at constant power. The variable pitch and if possible also the variable diameter propeller is the natural accompanying development of the supercharged motor.

Further calculations are made on the assumption that the propeller of fixed form is geared past a varying degree for each altitude in order that the increased power of the motor may be absorbed by the propeller in spite of the lower atmospheric density. The calculators show an increase in rotational speed from 1,400 to 2,700 r. p. m., and an increase from 96 to 182 m. p. h. forward speed at the new ceiling, which is at 49,000 ft. instead of 16,400 ft. But it must be remembered that the fatigue of the material at such high rotational speeds will be vastly increased. In addition the life of supercharged motors will be considerably shorter than that of existing motors employed on machines which fly largely at considerable altitudes, and in consequence great improvements will be needed before they can be utilized commercially or even militarily.

Mention is made of Rateau's turbo-compressor, driven by the exhaust gases. The compressor keeps a compartment filled with air at the ground atmospheric pressure, and it is from this compartment that the carbureter must draw its air supply. It is suggested that passengers and pilot might be placed in the same compartment and thus make flying at extremely high altitudes a practical proposition. The air in the compartment would be constantly renewed by the acting of the engine itself.

Duplex Governor Performance

IN THE advertisement of the Duplex Engine Governor Co., Chicago, printed on page 150 of the issue of *Automotive Industries* of October 2, it was said regarding the Simplex governor shown in the illustration that "the centrifugal unit and shaft have turned over more than 26,000,000 times." This sentence should have read: "The centrifugal unit and shaft have turned over more than 260,000,000 times." This correction is printed so that the remarkable performance of this unit may be fully appreciated.

Many Conditions Limit Automobile Exports to Mexico

An American Diplomatic agent discusses in detail the market for cars and tires in our neighbor country. Since this was written, import duties into Mexico on pneumatic tires have been increased from 0.75 peso per kilo to 1 peso, and solid tires have been reduced to 0.50 peso per kilo. Other slight modifications were made, the chief being that the surtax on parcel post packages has been increased to 25 per cent.

THE extensive use of automobiles in Mexico is hampered by unstable political and business conditions, according to a report from Vice Consul C. H. Cunningham, to the Department of Commerce. Eighteen thousand cars are estimated to be in use in Mexico, of which 5,493 are in Mexico City, including 2,337 private passenger cars, 1,916 taxicabs, 1,104 routed jitneys and 136 trucks.

Tires are being manufactured by local concerns employing American workmen whose tires sell for less than American tires. The higher prices of the American made tires, however, the report states, do not seriously affect their sale.

"It is estimated by dealers in Mexico City," the report says, "that 2 per cent of the population of this city are able to purchase cars. There undoubtedly would be more extensive ability to purchase were political and business conditions more stable. It undoubtedly is true, also, that American manufacturers would push sale of cars much more strongly than they do at present were it not for the newspaper agitation that is going on at present in the United States regarding Mexico. It is merely noted here that this continual effervescence is hurting business. A number of cases recently have come to the attention of

this Consulate General of the cancellation of representation in Mexico of automobile accessory firms as well as others, due to the uncertain political and, hence, business conditions prevailing. Small dealers are also hesitant about advancing money for cars and accessories.

"Another fact doubtless placing a limit on the use of automobiles in Mexico City and vicinity is the state of outlawry existing in the surrounding country which makes automobiling a dangerous pastime. With the exception of the Xochimilco and the San Angel thoroughfares, one hardly dares to issue more than five km. in any direction outside the city. The roads are in a bad condition and little or nothing is being done to maintain them. Nothing is being done on such formerly notable thoroughfares as the San Lazaro Road. The same may be said about the streets of the City of Mexico. Even the famous Paseo de la Reforma is now covered with ruts and chuck-holes and a driver must be skilled indeed to pilot a smooth passage over the famous thoroughfare. It can still be done by violating the rules of the road and dodging from one side to the other.

"There are no statistics available in the Government offices as to the mileage of good roads in this locality, but they may be summed up as follows, with indications

The Automotive Imports of Mexico

Cars, Trucks and Parts Exported from the United States to Mexico

(Totals are for Official Fiscal Years ending June 30)

	Cars	Value	Trucks	Value	Parts Value
1907....	465	\$ 681,086			\$131,553
1908....	244	354,338			47,279
1909....	200	282,462			104,984
1910....	245	459,077			81,248
1911....	350	614,160			35,506
1912....	273	418,599			47,479
1913....	235	423,123	35	\$ 83,363	46,743
1914....	155	239,166	12	17,509	41,508
1915....	70	66,830	8	14,492	30,819
1916....	383	309,200	51	100,500	42,258
1917....	2,807	1,642,011	218	198,151	125,823
1918....	2,578	1,653,545	365	525,664	431,440
1919....	2,168	1,960,613	614	832,112	.....

Prior to 1913
Commercial Vehicle
Statistics were
included under the
general head of
"Automobiles"

Germany's
Exports of
Passenger Cars
to Mexico

Year	Value
1909	\$ 52,000
1910	119,000
1911	243,000
1912	58,000
1913	142,000

France's
Exports of
Passenger Cars
to Mexico

Year	Value
1908	\$437,611
1913	425,796
....
....
....

Italy's
Exports of
Passenger Cars
to Mexico

Year	Value
1913	\$13,317
....
....
....

Automobile imports into Mexico from France, Italy and Germany—halted by the war—may be expected to recommence in varying degrees when present production plans of the European makers reach maturity. Mexico, which remained neutral throughout the fighting, may be expected to receive again, without delay, the trade emissaries of those countries.

in kilometers of the distances to the different suburban municipalities and resorts in the vicinity of the City of Mexico:

Desierto de los Leones.....	33 km. (of 5/8 of a mile)
Xochimilco	22 km.
Tlalpam	17 km.
San Angel	13 km.
Tacubaya	7 km.
Atzacapotzalco	13 km.
Guadalupe	5 km.

"The vast majority of tire importers in Mexico City prefer to have their tires packed as follows: First, each tire should be wrapped individually in heavy manila paper and then made up in bundles of from three to six, according to size. These larger packages should be wrapped in extra heavy water-proof paper or hemp cloth to insure their arrival in fresh condition. One firm recommends shipping eight or ten tires in a wooden box, but this is not universally approved because of the added weight, which means increased freight charges and increased duty, the latter being counted on a gross specific basis. The duty on tires is 37½ cents U. S. currency per kilo (of 2.2 lb.). The total average cost of freight and duty on outer tires laid down in Mexico City is 70 cents U. S. currency per kilo. Similar cost of inner tubes is 85 cents U. S. currency per kilo. Exporters when packing should remember that duty is specific and payable on gross weight, which includes total weight of contents plus packing and crate.

"The leading American tire manufacturing companies are represented in Mexico City. The 'Clincher' type of tire has about the same proportion of use here as in the United States. The high duty on tires does not serve as a deterrent to their use, although at present the competition of a local tire manufacturer is making inroads into the sales of imported tires. The local factory is making about 250 outer tires of all sizes daily, and is apparently disposing of about that number. The tire in question is advertised under a guarantee of 8,000 km. (5,000 miles) and is said to be well adapted to the local conditions of climate and use. This company also makes an inner tube.

"This manufacturer, an American, employs skilled American workmen who have been brought to Mexico in order to turn out workmanship equal to that of foreign competitors. The local manufacturer is compelled, however, to import the rubber which he uses and this places him in a disadvantageous position as compared with American tire manufacturers, who have access to a fairly steady market and who are enabled to buy in large quantities.

"There are probably half a dozen distributors selling the locally made tires in the City of Mexico and plans are now on foot for the establishment of agencies in the leading cities of the Republic.

"Following are two tables, the first showing the selling prices of the locally made tires, expressed in terms of U. S. currency. The second table shows the shipping weight with wrapping for shipment, according to sizes of imported tires, together with selling price of a well known American tire, here in Mexico City:

Retail Price List of Locally Made Tires

Size	Outer Tires	Inner Tubes
28x3	\$.....	\$ 3.65
30x3	15.90	3.18
29x3½ .....	.....	3.73
30x3½	18.55	3.35
32x3½	24.28	3.97
34x3½ .....	.....	4.25
31x4	27.55	5.00
32x4	24.70	5.15
33x4	31.62	5.43

34x4	33.38	5.62
35x4 .....	.....	5.94
36x4	36.30	6.10
33x4½ .....	.....	7.15
34x4½	40.08	7.27
35x4½	41.78	7.43
36x4½	44.63	7.60
35x5	55.65	8.76
37x5	54.80	8.90

"Retail price list of imported (Goodrich) tires, with wrapped weight of each tire. To compute duty multiply by 70 cents U. S. currency per kilo.

Size	Weight Kilos	Straight Side	Weight Kilos	Clincher	Straight Side
30x3	4.6	\$.....	5.0	\$18.13	\$.....
30x3½	5.8	.....	5.6	22.63	.....
31x3¾	6.2	.....	6.0	32.50	.....
31x4	8.0	.....	7.8	34.25	.....
32x3½	7.0	31.88	6.2	.....	32.75
32x4	8.0	32.75	8.3	.....	35.88
33x4 .....	.....	33.13	8.6	.....	36.25
34x4	8.6	34.38	9.2	.....	38.00
32x4½ .....	.....	.....	12.4	.....	47.13
33x4½ .....	.....	40.25	12.0	.....	48.38
34x4½	11.0	42.38	11.6	.....	49.50
35x4½ .....	.....	43.50	12.0	.....	51.00
36x4½	12.0	44.75	12.4	.....	52.38
33x5 .....	.....	.....	.....	57.38	55.00
35x5 .....	.....	50.25	15.0	60.63	57.88
37x5 .....	.....	52.63	15.8	62.50	60.75

Silvertown—(Cord Tire)

Size	Weight Kilos	Clincher	Weight Kilos	Straight Side
32x3½ .....	.....	\$.....	.....	\$40.88
32x4 .....	.....	.....	11.5	56.88
33x4 .....	.....	.....	.....	58.63
34x4 .....	.....	.....	13.2	59.63
32x4½ .....	.....	70.25	.....	71.88
33x4½ .....	.....	.....	14.2	73.00
34x4½ .....	.....	73.63	.....	75.38
35x4½ .....	.....	.....	14.4	76.50
36x4½	14.0	80.50	.....	79.00
33x5 .....	.....	79.38	.....	81.00
35x5	16.4	83.13	.....	88.88
37x5	17.0	87.00	.....	93.88

Inner Tubes

Size	Weight Kilos	Price
30x3	1.9	\$ 3.75
30x3½	1.2	4.38
31x3¾	1.3	5.38
31x4	1.46	5.38
32x3½	1.3	4.50
32x4	1.62	5.25
33x4	1.6	5.38
34x4	1.74	5.50
32x4½	1.94	6.38
33x4½	2.1	6.50
34x4½	2.1	6.88
35x4½	2.25	7.00
36x4½	2.2	7.00
33x5 .....	.....	7.63
35x5	2.47	8.25
37x5	2.64	8.38

The New Fiat Models

(Continued from page 754)

ing. Instead of the original heavy yoke at the front end of the propeller shaft housing, the ball and socket type of attachment and drive is now used. Fiat employs Gleason gears in the rear axle, these having been used for at least two years on cars supplied to the allied armies.

Both sets of brakes are inside rear wheel drums, ribbed to assist cooling. Steel cable controls are used for the braking system. Steering is worm and full wheel, with the box mounted on the forward face of the rear crankcase hanger. Springs are semi-elliptic underslung and mounted directly below the frame members.

The electric equipment is built in the Fiat shops. Fiat has adopted detachable steel spoke wheels.



The F O R V M



Cutout Still Used on Pierce-Arrow Cars

Editor Automotive Industries:

THE writer wishes to call to your attention an incorrect statement in the article entitled "A Two Spark Generator—Battery Type Ignition," in your issue of Sept. 11, 1919.

The particular statement reads as follows: "With either single or double ignition, the circuit between the generator and storage battery is also completed, thereby eliminating the use of the cutout relay ordinarily used for this purpose."

A cutout is used on the present series of Pierce cars, it being a part of the separately mounted voltage regulator. When the ignition is "off," the circuit between the B-minus terminal of the regulator and plus terminal of the ammeter is open and the switching on of either the single or double ignition closes this circuit.—E. A. COUSINS, Automobile Equipment Service Dept., Westinghouse Electric & Mfg. Co.

The Testing of Materials

Editor Automotive Industries:

IN answer to your letter of Sept. 17 relative to article on "The Testing of Materials":

After giving this subject some thought, I decided that our Metallurgical Department could, no doubt, give you a better picture of this proposition than I could. I therefore requested Mr. A. E. White, our consulting metallurgist, to comment on this article. I am quoting below Mr. White's comments.

"The article written by Mr. Walter Rosenhain, entitled 'The Testing of Materials,' has been read with considerable interest. Mr. Rosenhain quite properly points out the necessity of adopting tests which can be quickly performed and which duplicate, to as great an extent as is possible, the actual conditions to which the metal will be subjected in service. He points out that in the past too much reliance has been placed upon physical tests, which do not duplicate or give any indication of the properties required of the material. He indicates the present-day trend in the development of tests, which are representative of true conditions.

"Mr. Rosenhain also indicates that the designers of automobiles have designed the various members of the machine with as small cross sections as is consistent with safety. Such a condition as this makes it extremely essential that the material used be of the required quality for each and every piece employed. To reach this end the metal employed should be subjected to very thorough tests, and the automobile manufacturer should know the full history of the metal from the start of its refining to its final assembly.

"The feature just mentioned in the preceding paragraph was not developed in Mr. Rosenhain's paper, and it is the belief of this office that this is a very serious omission. Only by the most stringent safeguards will it be possible to keep out of production defective material. The numerous failures of metallic members that are every day occurring and the numerous rejections of material which occur during production, indicate the necessity for close supervision. Hitherto it has been more or less common practice to purchase material within close chemical

and physical property limits. The characteristics of the metal with regard to soundness, freedom from piping and segregation have been covered by general terms but metal has not been as thoroughly inspected against these defects as should be in the case. At least this is true to a great extent in the United States, although the writer does not personally believe that it is true to the same extent with steel made in Great Britain.

"Summing up the statement, one should require that, in testing materials, two conditions be fulfilled:

"1. That the test be representative of the service conditions.

"2. That the test be representative of the entire product submitted for acceptance.

"Mr. Rosenhain covers the first matter fully but fails to say anything in regard to the second and it is the belief of this office that, through a careful and rigid inspection of the steel at the steel mills, a forward step will be taken in ascertaining the degree of uniformity of the metal submitted for acceptance and in making sure that only metal of a high degree of uniformity is accepted."—J. G. VINCENT, Vice President of Engineering, Packard Motor Car Co.

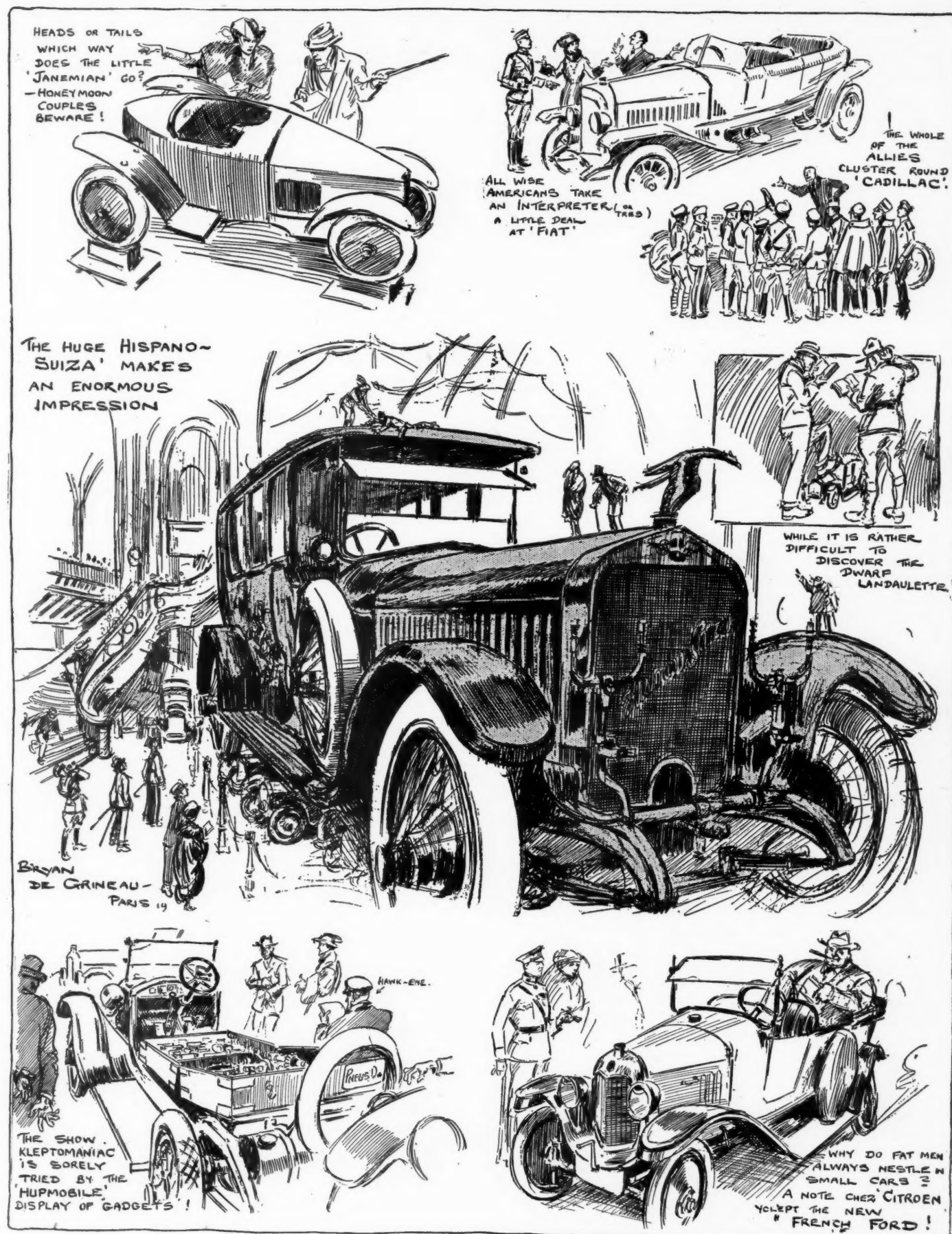
Farman Brothers to Produce New Six

HENRY and Maurice Farman, pioneer aviators and biggest airplane manufacturers in France, have entered the automobile manufacturing business and will put on the market a high-class six-cylinder car embodying much aviation practice.

During the war, Farman Brothers built a new factory for the manufacture of aviation engines and produced engines to Lorraine-Dietrich designs in large numbers. The buildings and plant are modern and are laid out according to up-to-date ideas for fine work and accurate methods. With the armistice, the Farman aviation engine factory was switched over to temporary automobile work for other firms, while designs and jigs were being prepared for the Farman's own car. This is now complete and will go into production at an early date.

Aviation methods enter extensively in the construction of the Farman car. Weight has been reduced to low limits by an extensive use of cast aluminum and steel stampings. There is not a single iron or steel casting on the car.

The production of silent chains will be one of the branches of activity of the Farman factory. At present, chains are difficult to obtain on the Continent and complaints are common regarding their quality. Practically all automobile chains used in France and Italy come from England, but the quality has been so poor of late that some of the largest automobile manufacturers are contemplating abandoning them altogether. The Farman chain presents new features which, it is declared, are the subjects of patents. The links, after being drilled for the pins, are case hardened by a new process in which the holes only are affected, no other portion of the link showing any trace of hardening. No bushing is necessary for the pin, thus allowing a bigger pin to be used together with a smaller hole. The wearing surfaces are reduced and, as the holes in the links are smaller, there is less liability of breakage of these latter.



A Cartoonist Sees the Paris Automobile Show

How the Employer May Control the Changing Demands of Radical Labor

In showing how the workers are deserting the views and disregarding the guidance of their leaders and their organizations, Mr. Tipper advocates the formation of labor organizations within each factory which permit collective bargaining and meet other needs of the workers. Labor, he says, is being influenced by men possessing no constructive ability who are drawing the workers away from their old leaders by virtue of irresponsible promises and criticisms of the deficiencies of the old union system.

By Harry Tipper

IN every powerful political body or body of social reform, or, in fact, in every organized group of human beings, there are a few men of restless and frequently brilliant, intellectual possibilities with a keen capacity for observing and capitalizing the deficiencies, but without the patience to define and the persistence to occupy themselves with the constructive necessities that are the basis of a solution. Such people form the natural opposition in any party and they are always to be found following those radicals who desire a change from the present system, so long as such radicalism offers no further responsibility than opposition to the present status.

They are furthered by our general habit of publicity in the public press, which leads us to regard the sensation as news and unconsciously emphasizes all those differences and deficiencies which are brought to the attention of the newspaper. The man who will get up in a meeting and denounce the present system of operation as conducted by the steel corporation is sure of a place on the front page of a newspaper or a decent amount of space in the news pages immediately following.

The man who should get up and call attention to the many wonderful developments which have taken place during the existence of the steel corporation, what has been done in building houses for their workers, in loaning money, in providing possibilities for stock ownership and in other ways improving their condition, would perhaps get a stick on the seventh page if his name carried sufficient weight and authority.

The restless, brilliant and destructive minds who are largely responsible for the development of disorderly radical opinion and action are kept alive and on their job by the apparent importance of their work. Mostly they honestly deceive themselves into the idea that destructive criticism and their emphasis of deficiencies are serving a great public good and are useful in providing a solution. Wise criticism is not sufficiently sensational.

What we hear regarding labor in the public press is the unrest. All the strikes are fully reported. We rarely hear the constructive side of the matter. The leaders who

stand out and refuse reconciliation are quoted at length, but nothing is said about the hundreds of thousands of cases where grievances have been smoothed out without a strike, where men of vision in industry from the ranks of management and labor have gotten together and spent their best efforts in constructing an agreement and in smoothing down the excitement of the crowd.

The labor movement, since it has begun to exhibit its power, has attracted the restless intellects who are eager to seize upon a new development which promises a new sensationalism and a change. They have been busy in the ranks of the American Federation of Labor for two years forming the opposition to the conservative leaders of the federated unions, drawing the union men away from old leaders by virtue of their irresponsible promises and their brilliant criticism of the deficiencies of the old labor union system.

The results have been plainly visible in the last few months. More and more the rank and file of labor organizations have been disregarding the advice and counsel of their older and more conservative leaders and have been following the siren voice of the irresponsible radical who is most capable when he is pointing out the deficiencies of present organizations and usually utterly incapable of constructing anything better.

In the Eastern section of the United States, which was the solid stronghold of the American Federation of Labor not many years ago, and even in those industries where the conservative character was best exhibited, the old conservatism has been lost. The demand of the four brotherhoods for control of the railroads exhibited a change in the point of view from the old creed of the American Federation to stand entirely away from politics or political issues.

The withdrawal of two or three local unions from the International Typographical Union in New York, the sympathetic strike by the compositors who are still within the International rank and the complete tieup resulting from this radical following, is an

indication of the strength of radicalism and its growth in New York City.

The same thing was exhibited even more thoroughly in the walkout of longshoremen, involving nearly 50,000 men. In this case every leader had unanimously agreed to support and abide by the decision of the conciliation board. Every labor leader disowned a strike. It was plainly shown that the men walked out without the approval and against all the advice of their executive officers. Nevertheless, within two days nearly 50,000 men left their jobs and in one case they severely maltreated a union agent—that is, one of their own officers, who dared to speak with them about the danger of breaking their agreements and going back on their own organization.

The demands of the coal miners and their threat to strike on Nov. 1, which threat is made definite and somewhat imperious in its tone, indicate the complete change in the leadership of the united mine workers in the short period of five years.

When labor union men refuse to follow the advice and instructions of their own elective officers, when local unions voluntarily outlaw themselves from the international body, when practically the entire union membership agrees to stand by the outlaws, the possibility of any agreement with labor as an organized body ceases to exist and the result is utter chaos as far as collective bargaining is concerned. From time to time in these articles we have insisted upon and emphasized the growing tendency of the unions to disregard the actions of their executive committees and their officers. We have pointed out the danger of this situation.

It is inevitable that the labor union as an organized body should break down of its own weight unless the orderly organization can be continued. The tendency to view with suspicion the actions of labor leaders who have learned by responsibility the necessary conservatism in dealing with the questions which come up and the ease with which opposition leaders can throw over the old policy and the old agreements, make it obvious that the labor union is not properly constituted in this country to act as the responsible voice of the workers.

The situation in Great Britain is entirely different and the ease with which the workers arrived at agreements through their appointed representatives in that country cannot be taken as any criterion as to what might be accomplished here. In Great Britain the industries are thoroughly organized. The habit of collective bargaining with the trade union is an old habit and has been customary in most trades for many years. Furthermore, the population is homogeneous. The foreign population is very small and most of it entered England during the early part of the nineteenth century and has been assimilated long ago.

There is a general similarity in the racial tradition, the political background, the organized understanding and the political ideals of the whole people, which makes it possible to arrive at conclusions and to conduct operations under agreements with these union bodies in a way for which there is no hope in this country.

As we have emphasized before, the opposite condition prevails in the United States. The workers comprise many races with different political traditions, with different backgrounds, with different habits of mind and ideals.

A great many millions of these people have never known authority except as oppressive and to be fought, and they are constitutionally against all authority because authority and oppression are synonymous in their minds. Millions more have been used to an entirely different system of government and to an entirely different type of industrial control and,

while several millions of these workers have been gathered into the old trade union idea, built up along the English plan and started by English and American workers, they have not been assimilated.

Perhaps, after all, this weakness of organized labor in this country, if we are sufficiently wise to undertake it, will permit us to provide a better basis of solution than the one which can be applied in Great Britain. There is nothing in the history of industry which would suggest that outside bodies can solve the difficulties within one organization thoroughly, and there are many reasons why the only sound condition in industry is to have the organization which is unified within itself and not the industrial organization which is split from top to bottom into opposing creeds with each side recognizing allegiance to outside parties and neither one recognizing thoroughly their obligation to each other within. The present breakdown of trade union authority and the strikes captured by the radicals indicate that agreements with the trade unions as such will not afford the manufacturer any satisfaction or any protection, because they are broken too easily.

The only possible solution of the difficulty will be for the manufacturer to lay the foundation for collective agreements with his own organization, and this means laying the foundation for discussion in such a way that confidence will be established.

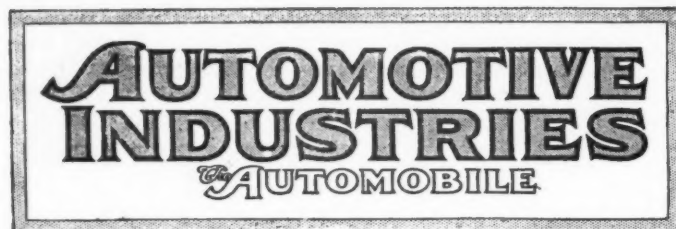
The open shop, that is the shop which does not consider a man's union affiliations at all, is undoubtedly an ideal situation, provided that the manufacturer's organization is so arranged that the worker secured within that organization the opportunity for free discussion, for a voice in the affairs connected with wages, hours of labor and other matters, and for a decent review of his personal grievances. The organization must be built with a unified purpose from within.

The allegiance to the craft or union and the lack of allegiance to the employer do not increase the possibility of agreement or unity but rather decrease it, and when the union men begin to forsake their strong conservative leaders, to refuse to fulfill their own agreements and to make demands when their own obligations require them to remain at work, the incapability of agreement that will lead to unity is emphasized. This emphasis should not be lost on the manufacturer.

The only sound fundamental position is the creation of legislative machinery within the organization that brings the management and the worker together upon all points regarding which there must be agreement in order to have continued work. The present condition in the labor union ranks should induce manufacturers to begin the investigation of this legislative machinery within the organization and should suggest to him the possibility of working out such organization, even though it may not function for awhile and even though it requires a great deal of persistent and patient work to make it effective.

It is obvious that, if agreements made with labor unions last year are broken before their life is over this year, agreements which may be made this year can be broken with equal ease, and no manufacturer who has been through a more or less disastrous strike can afford to look with complacency upon the possibility of its renewal whenever the majority or a vociferous minority of the rank and file of the labor unions decide that they can afford to undertake it.

There are plenty of individual examples of plans in operation which provide for all the discussion that is necessary and all the collective bargaining that is essential within the organization itself. These plans, which have been discussed many times in Automotive Industries, should be restudied.



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Export Financing

WHILE Congress has been talking about the League of Nations and the peace treaty a number of important business measures have been slumbering in the files of the committees. Just how much push the business men of this country have been putting behind their efforts to bring Congress back to the point of actively legislating for the good of the country instead of forming political issues for the next campaign cannot be stated. Probably it can be measured by the minus sign.

This is not as it should be. At periods like the present, it is important that our Legislature should be progressive and should look to the needs of business. In the older countries where certain ministries have the power to do certain things without consulting the legislatures, important steps have been taken as to placing these countries in a splendid position as regards business. In this country little has been done.

The fact that our country's laws were made for a self-contained country has been more or less of a handicap. Our financing system is not such as lends itself easily to foreign practice. But the system has much

elasticity, especially the Federal Reserve Banking System, and all that was required was a word from Congress extending its lawful scope. But this word was not given because Congress was debating other questions.

One of the bills that has slumbered was the Edge bill. The manufacturer should be well acquainted with this bill and also with other measures of somewhat similar purpose. He should urge his Congressman to get busy with these bills. The Edge bill has been passed by the Senate.

Scandals of 1920

"I SEE many things now going on in this race for foreign trade which make me think that in 1920 we shall have many trade scandals that will be difficult for the American business man to face."

This sentiment was spoken last week by an old-time exporter who was addressing a group of advertising men deep in the study of export trade.

Probably this man was right in his prediction, but let us hope not. At least let the automotive industry so conduct its export trade that none of these expected scandals shall come home to it.

The speaker then went on to tell of over-promising, poor packing, careless service, substitutions and other evils well known to merchandising. There is no excuse for these evils in any merchandising campaign, and least of all when pioneering is being done. The American automotive trade has the opportunity of establishing itself firmly and honestly in practically the entire world and should not miss even the smallest phase of the opportunity.

What Dealers Are Saying and Hearing

A FEW days ago the Rocky Mountain Auto Trades Association met at Colorado Springs, having present several officers of the National Automobile Dealers' Association. Generally speaking, the subject was to put the dealers' business on a higher level. But our interest was taken chiefly by that part of the report of the meeting which quoted sentences from four of the speakers. These were F. W. A. Vesper, president; Harry G. Mook, business manager, and C. A. Vane, general counsel, all of the N. A. D. A., and E. S. Jordan, the manufacturer. We are going to reproduce several of these quoted sentences, because they are worth thinking over. These quote Vesper:

"Let's educate Washington officials to stop comparing the motor car industry in this country with the industry in England, as a basis for taxation, regulation, etc., when there are only about 400,000 cars in all Europe, as against 6,500,000 in the United States."

"No sales talk sounds good through a cigar. It sounds worse through a cigarette. I'm not saying a word against smoking in its place. But do you think that it adds to the attractiveness of a \$3,000 car to have a salesman puffing smoke in the face of a lady prospect? Did you ever buy a \$1.50 shirt from a clerk that stood back of the counter and blew smoke at you?"

"It's high time for every dealer to stop talking about pleasure cars and wake up to the fact that this is an age of utilitarian vehicles—passenger and commercial cars.

"Good roads are sure to come. Let us back the Townsend bill, the proposed Colorado bond issue and all other good roads measures to the limit."

Some of the sentences ascribed to Moock follow:

"The automobile business will never get anywhere by making faces at politics."

"Inasmuch as the industry has grown to such an extent that it has a vital part in the daily life of every community, it necessarily follows that there is going to be legislation to regulate it. So it is up to the men who know the industry and who have millions of dollars invested in it to take a hand in making this legislation."

"This is not a call for business men to become politicians—but for business men to be business men IN politics."

Vane was, of course, interested in the law. Here are two of his quips:

"The unifying of laws affecting the motor car industry is something we must work for everywhere and all the time."

"If a law is not for the common good, it is NO good."

Jordan is now quoted:

"Labor must be taught to understand the value of production and enthusiasm. We can't do this in a week, but we can keep at the job all the time."

"Work will solve Bolshevism and similar evils."

"The backbone of business is made up of loyal, unorganized workers, who are now being pinched in pay, while ordinary labor is getting its full share, and capital is looking out for itself."

Tractor Prospects

IT is generally known that tractor sales in 1919 have not come up to expectations and that there is a certain amount of gloom in some sections of the industry. Whereas, in 1917 and 1918 most of the larger manufacturers fell short of meeting the demand for their tractors without making appreciable sales effort, lately conditions have been reversed and it has become necessary to develop the market energetically. This condition of affairs may not be pleasant to the manufacturer, yet it should be realized that it is quite normal; it does not come about often that the buyer has to run after the seller, and if this condition does arise it generally does not last long.

The above reflections are prompted by the paper by Mr. Yerkes, read before the Midway Section of the Society of Automotive Engineers. Mr. Yerkes, it seems to us, is taking an unnecessarily pessimistic view of the situation. We know from Government statistics that in 1917 the production of tractors increased substantially 100 per cent over the previous year, and during the first six months of 1918 the increase in production was at the same rate. This is a record which has seldom been equaled in any industry. Although the growth of the passenger automobile has been quite phenomenal, there has been no year since 1900 when the production, either on the numerical or the wholesale value basis, doubled that of the previous year.

It is now quite obvious that the heavy demand for tractors in 1917 and 1918 was due primarily to war conditions—the world-wide shortage of foodstuffs, the consequent high prices and the scarcity of farm labor. With the passing of these conditions, a slowing up in the demand was to be expected. It is possible that some of the large concerns engaged in tractor manufacture did not sufficiently consider the conditions affecting tractor sales and increased their production

at too rapid a rate. Some of the obstacles which will be encountered if it is attempted to force tractor sales too much are well pointed out by Mr. Yerkes. For instance, there is an enormous stock of horses in the country. This must be allowed to decrease gradually. If the adoption of tractors should run ahead of the natural decrease in the number of horses, then the sales value of horses would drop and the cheap horse naturally would offer keener competition.

The war has really been a boon to the tractor industry in that it has set farmers in all the chief agricultural sections of the country thinking and talking of tractors. To increase the advantage of tractor farming several things are essential besides improvement in design. One is a more extensive use of the tractor made possible by diversified crops and another an increase in the size of individual farms. There is some possibility that, as power farming develops, the co-operative purchase and use of farm machinery may find favor. But all of these plans are more or less radical and farmers as a class are quite conservative, so considerable time must elapse before any of them can be put into effect.

At the present time immense capital and high-class engineering talent are available to the tractor industry, and under proper direction the industry should make rapid progress. Yet time is a necessary element to the motorization of the farm. There is a certain inertia inherent in all human affairs and even the greatest of propelling forces is insufficient to accomplish a certain movement in an instant.

Hard Castings

THE advancing price and scarcity of pig iron seem to indicate that there will be no relief from the difficulty manufacturers now are having with hard castings. From nearly every plant in the automobile industry come complaints that the iron castings are so hard as to make a material difference in manufacturing cost, as well as to affect the quality of the product. Sand holes and blow holes are frequent and the castings are heavy.

The trouble is a direct result of the pig iron situation, which is quite serious. Prices for pig iron are going up all over the country. The prices in the Chicago market have recently advanced from \$26.75 to \$30 for foundry iron containing 1.75 to 2.25 silicon, and for the higher grades used for malleables the price has advanced to \$30.50. The iron is procurable at these figures only for the first half of 1920, as none of the furnaces of Chicago or northern districts is able to take further orders for the remainder of the current year.

Unless manufacturers of the automobile and allied industries are sufficiently forehanded in assuring their supply, the shortage of pig iron will be just as serious if not more so than the shortage of coal or steel. All of the foundries throughout the country are crowded with work, and manufacturers are finding difficulty in getting castings off patterns objectionable to the foundrymen. Precautions will have to be taken by the industry and a careful study of this situation made if the castings are not to be hard and scarce during the first half of 1920.

URGE ECONOMY IN USE OF FUEL OIL

Perfection of Mechanical Equipment and Discovery of Substitute Necessary

WASHINGTON, Oct. 13—"There are no known commercial substitutes for gasoline or lubricating oils. The domestic output does not meet the present consumption. Of the original available petroleum supplies underground we have consumed 40 per cent that is unreplaceable." These statements by Van H. Manning, Director of the Bureau of Mines, Department of Interior, have been made public to emphasize the great need in the petroleum industry for extensive research.

It is true, Manning states, that there are vast oil resources in foreign countries which can probably meet these demands for the next 10 years. Predictions beyond that period are not safe. Our efforts must be turned toward obtaining perfection in processes and mechanical equipment. "In 1918 the value of the output of crude oil and refined products in the United States was \$2,500,000,000," declared Manning, "and certainly the petroleum industry can afford to spend more than has been spent heretofore in research to discover new methods and perfect those now in use to make the recovery of oil and its utilization more efficient."

To emphasize his views, Director Manning has published the following statements by Secretary Lane of the Department of Interior, and M. L. Requa, formerly director of the Oil Division of the Fuel Administration.

Millions for Experiment

"It is not an exaggeration," states Secretary Lane, "to say that millions of dollars must be spent in experiment before we know the many services to which a barrel of oil can be put. There is almost an indefinite opportunity for research work along this line. Petroleum is a challenge to the chemists of the world. And now the world is dependent upon it as it is upon nothing else excepting coal, iron, foodstuffs and textiles. It has jumped to this high place within 20 years, and the world is concerned in knowing how large a supply there is and how every drop of it can best be used."

"We are behind the rest of the world in the use of our oil for fuel purposes."

"We are spendthrifts in this as in other of our natural resources. We can get three times as much energy as we do out of our oil through the use of the Diesel engine, yet we are doing little to promote development of a satisfactory type of stationary Diesel or marine design. Instead of seeing how many hundred millions of barrels of oil we can produce and use, our effort should be to see how few millions of barrels will satisfy our needs."

Requa said "Because of the tremendous increase in the consumption of petroleum

products, we have confronting us problems that have been of little concern in the past but will be of very much greater concern in the future. Satisfactory answers can not be made, except through constructive action upon the part of the industry. There is no alternative, in my judgment."

Revise Tire Import Duties In Mexico

WASHINGTON, Oct. 11—Important reforms in the import and export tariffs recently were decreed by the President of Mexico, after a conference with the Ministry of Finance and Public Credit, according to a Commerce Report.

As there are now two factories in Mexico producing automobile tires with a capacity of more than 100 per day, the import duties on this commodity have been increased from the former rate of 0.75 peso per kilo to 1 peso. Local factories are not producing solid tires for trucks and duties have, therefore, been reduced by 0.25 peso per kilo, making the rate under the new ruling 0.50 peso. The import duty on motorcycles is fixed at 1 peso per kilo, legal weight.

Another important modification which is to take effect on Oct. 1 is that by which the additional tax on merchandise imported by parcel post is increased from 15 per cent to 25 per cent, this surtax being levied on the amount of duties as per schedule.

ORDERS CHANGE IN NAME

WASHINGTON, Oct. 14—Finding that the similarity in the trade names "Universal Battery Service Company," adopted by James B. Shafer, Chicago, dealing in automobile storage batteries, and "Universal Battery Co.," the name of a previously-established Illinois corporation, has caused confusion among purchasers and has deceived and misled the general public, the Federal Trade Commission has ordered Shafer to discontinue use of the word "universal" in connection with the manufacture or sale of storage batteries.

NATIONAL PRICE INCREASE

INDIANAPOLIS, Oct. 15—An advance of \$140 on the open models of the new Sextet series was announced here today by the National Motor Car & Vehicle Corp., makers of the National line. The closed models remain unchanged. The new schedule follows:

Seven-passenger touring car.....	\$3,290
Four-passenger phaeton.....	3,290
Two-passenger roadster.....	3,290
Four-passenger coupe.....	4,200
Seven-passenger sedan.....	4,250

BURGESS PLANT GROWS

MADISON, WIS., Oct. 13—The Burgess Battery Co., organized two and a half years ago to manufacture dry cells and accumulators, will enlarge its plant by erecting a one and two-story addition, 120x150 ft. The building will cost \$200,000, including new equipment, and output will be more than doubled.

BRITISH FIRM BUYS 16,000 ARMY CARS

Takes the Vehicles of Third Army In Germany— Parts Scarce

PARIS, Oct. 4 (*Staff Correspondence*)—Sixteen thousand American army automobile trucks and passenger cars, forming the surplus stock of the Third Army in Germany, have been sold to a British syndicate. These trucks and cars comprise all makes, and are in all kinds of condition, from unused vehicles to shell-shattered and war-worn wrecks. After the present army of occupation had been provided for, it was decided to dispose of all these automobiles in a single sale to a single purchaser.

All these vehicles are now on German territory and it is understood that few, if any will be brought into France. Probably the majority of them will go to England, although Belgium, Poland and other continental countries may be purchasers.

Includes All Army Cars

All the American army vehicles now in France have been turned over to the French government which this week will put the first lot on sale. These sales, which are by auction, will begin in Paris with motorcycles of American and English make. During the present month there will be sales of American army automobile material at Romorantin and at Verneuil. It seems to be the intention of the French government to put these automobiles on the market in small quantities at a time in order to cause the least possible disturbance.

The 2,000 British-built automobiles and trucks owned by the American army in France, have been secured by the syndicate which has purchased the 16,000 in Germany. All these have been sent to England, and will be disposed of in that country.

Although spare parts are being sold with army trucks, the question of the maintenance of the American vehicles left in Europe has not received sufficient attention. The army stocks are lopsided and, with the exception of a few firms, among them being the Pierce-Arrow and Cadillac, there is no organization in France to take care of the cars which are about to be put on the market and which probably will meet ready sale.

Tire Shortage Great

The tire situation is equally neglected. Outside of the army stocks there are no solid tires to American sizes. Straight side tires and American size pneumatics are unobtainable in France. There is practically no provision at the present moment for taking care of the purchaser of an American car fitted with straight size tires in inch sizes. As a consequence, there is a tendency to convert immediately the wheels of these cars to clincher rims in millimeter sizes.

DEALERS SAVED FROM PAYING DOUBLE TAX

New Internal Revenue Ruling Provides Certificates for Parts Assemblers

WASHINGTON, Oct. 14—A new ruling has been issued by the Internal Revenue department, together with a new form of certificate which is expected to prevent dealers from paying a double tax on automobiles and parts. The ruling is intended to save dealers from paying a tax on parts to the manufacturers and again, when sold, to the government.

The new ruling is that when a dealer buys a body from one manufacturer and a chassis from another and assembles them, he becomes a manufacturer, and if he will file a certificate, such as follows, he will not have to pay a tax when buying the chassis, body or other parts from the manufacturer, but will pay only one tax on the retail price of the assembled automobile, which he will collect at the time he makes the sale.

The certificate allows him to purchase tires, inner tubes, parts or automotive equipment from any manufacturer without paying a tax, but obligates him to pay a tax when he makes a sale of parts, tubes, tires or accessories. If he assembles the parts he purchases into a passenger car and sells the car, a tax of 5 per cent on the sale price is due the government, but until these parts are sold in an assembled car or separately, the dealer does not have to pay a tax. If the parts, tires, tubes or equipment are for free replacement under a contract or a guaranty, no tax applies.

The Certificate

Following is the new form of certificate which is to be filed with each manufacturer from whom the dealer purchases:

"The undersigned hereby certifies that he is a manufacturer or producer of automobile trucks, automobile wagons, other automobiles, motorcycles, tires, inner tubes, parts or accessories, and that the tires, inner tubes, parts or accessories purchased hereunder are purchased by him as such a manufacturer or producer for resale in some form or manner, or for free replacement under contract or guaranty, and agrees if any of the tires, inner tubes, parts or accessories are sold by him exempt from tax to another manufacturer or producer of automobile trucks, automobile wagons, other automobiles, motorcycles, tires, inner tubes, parts or accessories for like purposes, he will require a similar certificate from such manufacturer or producer.

"The undersigned further agrees that in respect to all tires, inner tubes, parts or accessories sold by him, unless such sale is made to such a manufacturer or producer, he will pay the tax on such sale direct to the Internal Revenue Collector, including it in his tax return covering the month in which such sale is made; said tax to be paid on the basis of the taxpayer's selling price of such articles

when sold other than on, or in some connection with, the sale of new automobile trucks, automobile wagons, other automobiles, motorcycles, tires, inner tubes, parts or accessories, and on the selling price of such vehicles or articles when the same includes such articles.

Senate Amends Bill To Punish Car Thieves

WASHINGTON, Oct. 13—The Dyer bill to punish persons who transport stolen motor vehicles in interstate or foreign commerce, passed by the House, has been passed by the Senate with two amendments which sent the bill to conference of the House and Senate committees.

One amendment by the Senate abolishes the provision which would bar further prosecution in event of acquittal or conviction. The other amendment eliminates the words "with the intent to deprive the owner of possession thereof" from Sec. 4, which provides a fine of not more than \$5,000 or five years' imprisonment for any one who receives, stores or sells an automobile in interstate or foreign commerce, knowing it to have been stolen.

NEW RUBBER CO. FORMED

MILWAUKEE, WIS., Oct. 13—Articles of incorporation have been filed by the Toman Rubber Works of Milwaukee, with a capital stock of \$25,000, to manufacture tires, tubes and other rubber products. Leo Hofmeister, 174 Sixteenth Street, M. J. Waechter and M. E. Hofmeister are the incorporators.

U. S. RESTRICTS SALES

WASHINGTON, Oct. 10—Government owned automobiles which are being sold at public auction cannot be sold to persons who, as officers or agents of the Government, were in any way connected with the purchase of the automobiles or are connected with their sale, according to a ruling by the Secretary of War.

NAMED TRADE COMMISSIONER

WASHINGTON, Oct. 15 — William Ford Upson has been appointed Trade Commissioner to Vienna, where he will investigate general commercial and economic conditions in Austria and Serbia.

FIAT INTERESTS IN STEEL TRADE

NEW YORK, Oct. 16—Private cables to New York yesterday reported that Italian financial groups, headed largely by the Fiat Co. interests, had purchased the Austrian steel corporation known as the Alpine Montan Gessellschaft, insuring for Italy sufficient material for her interior needs. G. Agnelli, president of the Fiat company, was the prime factor in the negotiations for the Austrian company, which before the war was said to have had an annual production of 1,000,000 tons of pig iron and steel. Rumors also stated that Fiat interests recently have made large investments in American shipyards and in New York real estate.

COUNTRY'S TIRE BILL REACHES BILLION

Time to Pay Attention to Effect of Roads on Motor Cars, Says Eldridge

WASHINGTON, Oct. 11—"Twenty-eight million tires are necessary yearly to equip the passenger automobiles and motor trucks in use in the United States. To this should be added not less than twelve million more tires, for many vehicles accumulate mileage to such an extent that a second set of shoes is necessary, to say nothing of the thousands of inner tubes." This declaration was made by M. O. Eldridge, director of roads of the American Automobile Association.

"Forty million tires and their inner tubes, at an average cost of \$25, gives a total tire bill of \$1,000,000,000—a fairly tidy annual expenditure for road travel and transportation," he continued. "Hence it is high time to pay a little more attention to the effect of the various road surfaces on the motor vehicle, instead of considering only the damage by the motor vehicle to the road.

"You can scarcely pick up a paper without seeing in it something about how and why the fast moving passenger car and the loaded motor truck damage the road, and you note how the writer proposes to design a highway to withstand these effects, how speed and weight should be limited and how the cost burden should be distributed.

"Few of those who discuss transportation questions give thought to the fact that our seven million motor cars, which require annually twenty-eight million tires, exclusive of renewals, create a problem, namely, how fast will these tires wear out on each type of road surface? Compare, for instance, the smooth resilience of Fifth Avenue with the rough, gritty and flinty surfaces so often encountered on country roads, and try to imagine what a tidy sum in tire bills would be saved if we could all travel on avenue surfaces. The saving in tire costs alone would pay the difference in construction cost in many instances.

"How much does the road surface govern the amount of gasoline required by the motor vehicle? This is an important and timely question, for right now serious minds are worrying over the future of power sources for motor cars. No conclusive tests have been made on all types of road under absolutely uniform conditions and with disinterested motives. Such data as has been assembled shows that road surfaces offer tractive resistances running all the way from 300 lb. or more per ton for sand and loose gravel to 20 lb. and less for the best grades of smooth, hard-surfaced pavements.

"These tests, however, should be standardized and made authoritative so we can tell whether the saving in tires and gas and car and engine justify a change in type or a modification of the conception that the road and not the vehicle is the principal consideration."

MOUNTAIN DEALERS HAVE ANNUAL MEET

Pledge Support to National Legislative Program—Body Doubles Membership

COLORADO SPRINGS, COL., Oct. 8—The annual convention of the Rocky Mountain Auto Trades Association closed here today after the body had taken action of many matters pertaining to the trade in this section of the United States. Among these were:

State and national legislation for the benefit of dealers, manufacturers and car owners.

Inter-state acceptance of motor vehicle licenses without additional registration.

More rigid prosecution of motor car thieves.

Protection of dealer's interests wherever a car not fully paid for is confiscated for carrying liquor was pledged support by the association. The body also resolved to co-operate with the national trades body in its educational campaign to protect the automotive industry in general against unjust taxation.

The convention speakers were F. C. Farquharson, Trinidad, Col., retiring president; F. W. A. Vesper, C. A. Vane and Harry G. Moock, St. Louis, president, general counsel and business manager, respectively, of the National Automobile Dealers' Association; H. S. Quine, Akron, Ohio, representing the Goodyear Tire Co.; A. E. Mitzell, Canton, president of the Ohio Trades Association and a director of the national trades body; Mark Skinner, Denver, United States Internal Revenue Collector; L. C. Block, president of the Philadelphia Auto Trades Association, and Edward S. Jordan, Cleveland, president of the Jordan Motor Car Company.

The following officers and directors were elected for the year: President, Finlay L. MacFarland, Denver; vice-presidents, A. R. Davis, Raton, N. M., and J. Allen Wikoff, Clayton, N. M.; treasurer, L. R. Bach, Denver; secretary and business manager, Harrison Goldsmith, Denver; directors, George E. Glyssen, La Junta, Col.; W. S. Young, Walsenburg, Col.; J. F. Knight, Greeley, Col.; W. T. Mathis, Pueblo, Col.; O. J. Vollmer, Colorado Springs; S. T. McCollum, Denver; W. E. Dinneen, Cheyenne, Wyo.

The association membership has increased from 303 to more than 600 in less than a year. More than 150 members have been obtained in an intensive "drive" during the last few weeks.

WILLIAMS SOFT PEDAL CO.

CEDAR RAPIDS, IA., Oct. 13—The Williams Soft Pedal Co., of Cedar Rapids, Iowa, has incorporated for \$100,000, paid up capital being \$35,000. They are at present manufacturing the Williams soft pedal and expect to manufacture several other devices in the future.

A. A. Williams is president; E. Kullberger, vice president, at present connected with the Cedar Rapids Buick Co.; H. G. Miller, treasurer, formerly a Cedar Rapids Buick dealer, also W. J. Hutchings, who has been in the automobile business a good many years.

Publication of this issue of Automotive Industries has been delayed until Nov. 17 by conditions over which the publishers have had no control. Further issues will be forthcoming as rapidly as they can be printed.

Reciprocal Tariff On Cars Proposed

PARIS, Oct. 5 (*Staff Correspondence*)—According to a telegram from Rome, the Italian Government has proposed to all Allied nations a reciprocal 15 per cent tariff on automobiles. While this information has not been confirmed, there is every reason to believe that it is correct. Several months ago an agreement was reached between the Italian and the French Governments for the adoption of reciprocal 15 per cent import duties on automobiles. Although fully prepared, this agreement has been in suspense awaiting signature.

Under this general arrangement, each European country would admit the automobiles of Allied nations on a 15 per cent basis. The European countries are now prepared to admit American machines on the same basis, this implying of course a reduction of American duties of 45 per cent to 15 per cent.

MAKERS ENLARGE PLANTS

CLEVELAND, Oct. 10—The Chandler Automobile Co. and the Cleveland Automobile Co. will invest \$1,000,000 in new buildings at once. Of this amount \$800,000 will be spent in improving the Chandler property, while \$200,000 will be invested in additional buildings for the new Cleveland concern.

RAJO MOTORS FORMED

RACINE, WIS., Oct. 13—The Rajo Motor Co. of Racine, Wis., has been incorporated with a capital stock of \$25,000 by John Olle, John H. Tooman and Joseph Jagersberger. The last-named incorporator was a former member of the Case racing team under the late Louis Strang.

Artificial Leather Concern Organized

DETROIT, Oct. 13—The Leather-like Co. has been organized here and has taken over the plant of the Metropolitan Mfg. Co. The company will manufacture artificial leather. The officers are: President and general manager, A. F. Heidkamp; vice-president, Capt. Thomas Hoatson; secretary, F. J. Kohlhaas; factory superintendent, Edwin Armitage.

NEW CURRY BILL PLANS AIR BODY

Department of Aeronautics With \$12,000 Director to Combine Air Forces

WASHINGTON, Oct. 11—A new bill, providing for a Department of Aeronautics, has been introduced in Congress by Representative Curry, of California. This bill, which follows one introduced by him July 28, is a combination of his original bill and the bill introduced in the Senate by Senator New. It also contains some additional features based on the international air regulations as provided for in the peace treaty.

Instead of asking for a secretary of aeronautics, as in his previous bill, Curry now urges the establishment of a department with a director at the head having a salary of \$12,000 per year. The bill, despite its numerous changes, remains chiefly an act that would establish a Department of Aeronautics primarily for an aerial defense of the United States. It includes, among other new provisions, certain activities which would be helpful to commercial aeronautics, such as the collection and dissemination of information, the issuance of licenses for aircraft and the promulgation of regulations to cover international and interstate flying. It also authorizes the director of aeronautics to establish aerial routes throughout the United States, but provides that these will be selected to "insure the most rapid concentration of the air forces in times of war or threatened hostilities."

The original bill, which provides for the transfer of the Motor Transport Corps to the Department of Aeronautics, has been amended so that this provision is also abolished, but the control of the necessary motor vehicles in the aeronautic department is transferred to the Director of Aeronautics.

To Control All Phases

Similar to the original bill, the new one creates a Department of Aeronautics which would control every phase of aviation in the United States and devotes considerable space and provisions to the establishment of a military air force, under the Department of Aeronautics, specifying the numbers of generals, colonels, other officers and enlisted men to make up the organization, and providing for their transfer from other army corps. It would specifically hold the Director of Aeronautics responsible for the aerial defense of the United States.

That the National Guard of the United States will probably have an air force is indicated by Sec. 21, which places the National Guard air force under the direction of the proposed Director of Aeronautics.

This bill, like the original one, would take over all of the air functions of the Post Office, War, Navy and Treasury departments, the latter department having been added in the recent act.

Rubay Co. Announces \$850,000 Stock Issue

NEW YORK, Oct. 16—The Rubay Co., makers of closed automobile bodies, is offering through Lawrence Chamberlain & Co., New York, \$850,000 worth of 7 per cent cumulative preferred stock. The Rubay plant occupies three acres at Cleveland. New buildings to occupy an additional 1½ acres are planned.

Leon Rubay, who built the present business, will continue in the management of the business. Associated with him is Harry E. Shepler, formerly vice-president of the Willys-Overland Co.

FIRM CHANGES NAME

CLARINDA, IOWA, Oct. 10—Dunn Counterbalance Co. has changed its corporate title to Dunn Manufacturing Co. There is no change in the personnel of the company.

TWO NEW TIRE PLANTS

COLUMBUS, O., Oct. 10—While work on the new plant of the Henderson Tire & Rubber Co., located on Goodale Boulevard, is nearing completion, it is announced that work has been started on the new plant of the Columbus Tire & Rubber Co., located on West Goodale Street. The first named plant will start operating with about 200 employees and

that number will be rapidly increased. The second named plant will cost \$85,000 with equipment and will employ about 150 people at the start. It is expected to have the last named plant ready for operation by the first of the year.

AUSTRALIAN LIMITS ACTIVITIES

NEW YORK, Oct. 14—J. B. Clarkson, who for years has been managing director of one of the largest motor distributing agencies in New Zealand, has withdrawn from active connection in business because of ill health, according to letters received here, and in the future will confine his activities to the De Dion Bouton agencies in New Zealand, Australia and the Pacific islands. Clarkson is a director of De Dion Bouton, Ltd. His successors in New Zealand are Hope Gibbons, Sons & J. B. Clarkson, Ltd., Wellington, with Alf. B. Gibbons as managing director.

In addition to handling the De Dion Bouton interests, Clarkson will open offices at 76 Pitt Street, Sydney, Australia, handling the interests of Hope Gibbons, Sons, & J. B. Clarkson, Ltd.

NOVO ENGINE CO. BUILDS

LANSING, MICH., Oct. 11—The Novo Engine Co. will begin the erection at once of a third unit to its plant. It will be 130x160 ft., one story high.

Boyer In Frontenac Wins Cincinnati Race

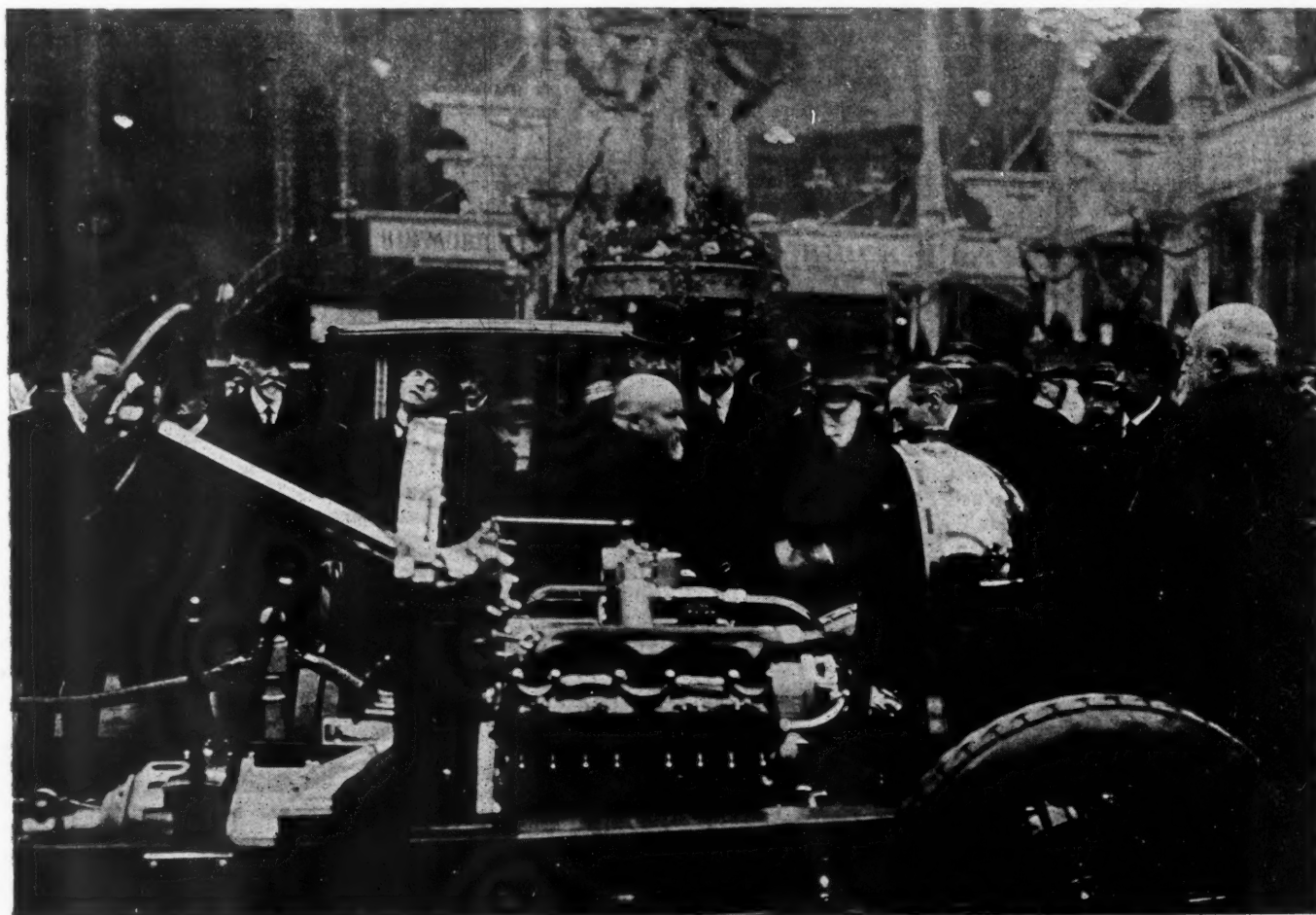
CINCINNATI, Oct. 13—Joe Boyer drove his Frontenac home first in the 250-mile race here Sunday, Oct. 12, covering the course in 2 hr. 22 min. 19 sec., and averaging 101.69 mi. for the elapsed time.

The race was to have been run Saturday, Oct. 11, but was postponed on account of rain. Art Klein, driving a Peugeot, was second. Other contestants finished in order as follows: Kurt Hilke (Kenworthy), Dave Lewis (Meteor Special), Denny Hickey (Stickel), Tom Alley (Bender Special), Waldo Stein (Oldfield) and Omar Toft (Toft Special).

WISCONSIN RAISES COMPENSATION INSURANCE

MILWAUKEE, WIS., Oct. 11—The Wisconsin Industrial Insurance Board has authorized an increase of approximately 11.4 per cent in rates on workmen's compensation insurance. The insurance companies requested an advance of 15 per cent in rates to meet a heavy increase in disability schedules in the Wisconsin workmen's compensation act made at the recent biennial session of the state legislature, and the liberal increase in the average payroll since the former rate schedules were fixed. In Wisconsin the workmen's compensation act is compulsory upon all employers.

The Paris Automobile Show



President Poincaré of France inspects some of the exhibits

EXPORTS SHOW BIG GAIN FOR AUGUST

Commerce Report Reveals Total Was \$16,491,777— Tables Announced

WASHINGTON, Oct. 14—Automotive exports from this country for August, detailed figures for which were announced by the Department of Commerce today, show a striking expansion over the preceding month, reaching a total of \$16,491,777. A consolidated table, printed on the opposite page, reveals that the increase over the July figures was \$4,168,907, the amount for that month having been \$12,322,870. The gain for August was approximately 33½ per cent.

The exports covered in the reports are for passenger cars, trucks, tractors, tires and equipment. The largest gain, in point of volume, came under the passenger car heading, the total for the month having reached the unexpected figures of \$6,855,277, an increase, in round numbers, of \$1,900,000. However, the shipments of tractors came within \$125,000 of being double the value for July and each of the five divisions showed a healthy enlargement that indicated American manufacturers were reaching out into new territory and were developing further the territory previously entered.

Few countries or political districts, except, of course, those to which American exporters are barred because of the failure to ratify the peace treaty, were without shipments of some sort, either of automobiles, tires or parts. Eighty-four countries are covered by the tables announced, these taking in all parts of the globe with the exception of some of the new nations of Europe and the enemy regions. None of these was without some sort of imports from American automotive firms.

Large increases of car shipments to Japan feature the report, the August number having been 232, compared with 70 for the previous month. Spain also took many more cars, the comparison between the two months being 273 to 31. Of similar interest, although larger in number, was the export to Brazil, a country that was not included in the tabulations prior to July, when 110 cars valued at \$99,050 were taken. August brought the total, as the curve swung upward, to 562, worth \$371,103. British South Africa, like Brazil, enlarged its taking of American cars, with a total for the month of 368 with a value of \$429,409, more than twice the valuation for July. The exported cars, as distinct from other categories, went to 70 countries, an increase of 11 for the month. Two other worthwhile markets were shown as being Australia and New Zealand.

The truck exports were larger than for the preceding period. The largest receivers were Canada and France, although Norway and Mexico were well up in their takings.

England, which figured as only a minor importer of trucks and was held down on

car receipts because of importation bans, was the heaviest receiver of American tractors, the number being 365, valued at \$280,178, as compared with 154 worth \$70,124 for the preceding period. France, Canada and Denmark followed in that rotation for tractor takings. Other countries, however, notably Peru, Australia, and the Philippine Islands, increased their imports by a high percentage. Thirty-seven countries were shown to have received American tractors for August, against 27 for the earlier month.

Argentina was the greatest importer of tires, while Cuba, Denmark, England, Uruguay and New Zealand were largely concerned in contributing to the month's increase on this article. Spain, perhaps, was the most spectacular market for tires, the jump being made from \$14,008 in July to \$158,841 in August.

Italy continued as a negligible market for the American automotive products, the importation restrictions having remained in effect.

Farm Tractor Exhibit Opening Is Postponed

NEW YORK, Oct. 16—Strikes and traffic troubles have postponed the opening of the International Farm Tractor and Implement Exchange, in Grand Central Palace, at least two weeks.

The exhibit was to have been opened Oct. 15, but only two of the firms who have contracted for space in the exchange had placed products on the floor on that day.

Many of the farm tractors were held up in the freight terminals of Jersey City and Brooklyn, and others had been delayed along the route by various conditions.

Nearly eighty percent of the space is said to have been taken by prominent automotive farm implement makers.

TRUCK PARADE A SUCCESS

DENVER, COL., Oct. 10—Farmers, dairymen, stockmen, merchants, manufacturers, public officials and truck dealers in Northern Colorado were given a practical "short course" in the efficiency and economy of motor transportation recently by a caravan of thirty-six trucks and eight trailers on a "Ship by Truck" tour from Denver to Lafayette, Boulder, Longmont, Berthoud, Loveland, Ft. Collins, Windsor, Greeley, Platteville, Ft. Lupton, Brighton and return. The educational enterprise was carried out under the auspices of the Denver and Rocky Mountain automobile trades associations and was aided by a special proclamation issued by Gov. Oliver H. Shoup, calling upon all citizens to co-operate toward the success of the event.

NEW FIRE EXTINGUISHER

NEW YORK, N. Y., Oct. 10—C. Louis Allen, formerly president of the Pyrene Manufacturing Co., has given the name Pronto, meaning "quick," to the simplified fire extinguisher which he has recently developed and is now manufacturing through The Allen Corp., of which he is the president.

Form Export Credit Information Body

NEW YORK, Oct. 13—Formation of the Foreign Credit Clearing House, for the purpose of diffusing credit rating information concerning foreign buyers, has been announced here. The new organization will comprise banking, manufacturing and exporting interests and will establish branches in some twenty foreign countries, it was given out. Headquarters will be here.

The association was formed, Mark C. Prentiss being chairman of the board, to meet a need expressed by importers for ascertaining the true financial conditions of purchasing houses in foreign countries. Although much information has been in the hands of various exporting firms in this country, it has never been collected, according to members, and could not easily become available for the guidance of manufacturers. The clearing organization will seek to collect this wealth of knowledge so that all interested firms may profit by it.

A probable membership of 5,000 firms was expected.

SEEKS LARGER QUARTERS

DETROIT, Oct. 13—Theodore F. MacManus, Inc., has occupied its own building at 44 Hancock Avenue, East. The steady growth of the business made it necessary for Mr. MacManus and his associates to seek larger quarters, and the new building was purchased because it could be readily remodeled into a private office building and because the premises provided room for future expansion.

MUST HAVE LICENSE

HARTFORD, CONN., Oct. 10—Under the Connecticut law an aviator carrying passengers must have a license. Up to this week but one man in the state had been licensed. A New Yorker, however, has been carrying passengers in a Canadian bomber at \$15 a ride. The state police interviewed him and he had to take out a license.

A. M. P. CO. IN NEW HOME

DETROIT, Oct. 10—The American Machine Products Co. has moved into its new two-story factory building. The structure has 10,000 sq. ft. of floor space. E. A. Munger is the president and general manager.

JOINS HAYES-IONIA CO.

DETROIT, Oct. 11—A. A. Anderson, for many years prominent in banking and financial circles in Michigan, has joined the forces of the Hayes-Ionia Co., parts manufacturers, of Grand Rapids, as treasurer, according to announcement made here today. He succeeds Dudley E. Waters, who becomes vice president. Anderson for years has been cashier of the Hastings City Bank, of Hastings, Mich., and is treasurer of the Hastings Wool Boot Co., the Hastings Table Co., and the International Seal and Lock Co. His home is at Hastings.

Automotive Exports from the United States by Countries During August

Countries	Trucks		Cars		Parts	Tires	Gasoline	Tractors
	No.	Dollars	No.	Dollars	Dollars	Dollars	No.	Dollars
Belgium	16	25,659	201	158,496	4,023	3,170	3	677
Denmark	58	140,769	265	358,815	14,986	166,448	213	171,652
Finland	7	6,848	12	8,946	782	.....	.....	.....
France	148	622,634	42	87,631	14,337	62,665	276	293,599
Greece	3	1,510	39	55,798	5,929	9,031	.....	.....
Italy	1	2,500	1	3,000	1,179	25	.....	.....
Malta, Gozo, and Cyprus Islands .....	.....	.....	17	13,214	31	.....	.....	.....
Netherlands	26	67,385	123	152,670	17,409	105,442	.....	.....
Norway	81	191,840	381	334,158	94,610	122,360	38	27,774
Portugal	6	16,130	34	57,829	1,058	51,126	1	315
Roumania	66	64,051	4	11,592	878	14,561	.....	.....
Russia in Europe .....	.....	.....	1	600	.....	.....	.....	.....
Spain	31	85,465	273	301,934	39,810	158,841	32	44,994
Sweden	18	29,513	153	182,958	3,768	31,876	48	34,211
Switzerland .....	.....	.....	.....	.....	25	7,490	.....	.....
Turkey in Europe	3	11,900	.....	.....	.....	.....	10	14,000
England	7	16,788	401	448,639	184,042	154,988	365	280,078
Scotland .....	.....	.....	3	8,288	1,701	.....	.....	.....
Ireland .....	.....	.....	.....	.....	24	.....	.....	.....
Bermuda .....	.....	.....	.....	.....	120	163	.....	.....
British Honduras .....	.....	.....	6	3,333	1,161	575	.....	.....
Canada	242	389,104	688	854,452	1,653,664	71,518	244	236,292
Costa Rica .....	.....	.....	2	2,543	108	254	1	837
Guatemala .....	.....	.....	22	19,796	2,856	5,239	1	768
Honduras	2	3,360	.....	.....	1,074	4,121	.....	.....
Nicaragua	2	867	5	3,892	904	2,620	.....	.....
Panama	2	1,007	9	8,986	3,428	21,345	.....	.....
Salvador .....	.....	.....	6	8,390	4,607	3,324	1	2,100
Mexico	80	120,525	215	157,283	47,926	57,354	34	44,491
Miquelon, Langley, etc.	2	2,000	.....	.....	.....	.....	.....	.....
Newfoundland and Labrador ..	3	12,682	34	34,865	3,254	2,395	.....	.....
Barbados	2	1,008	9	6,419	3,739	1,577	.....	.....
Jamaica	2	4,434	7	9,695	10,260	12,533	1	259
Trinidad and Tobago	2	1,007	31	21,943	7,217	4,474	4	3,901
Other British West Indies ..	2	1,008	6	8,390	4,607	3,324	1	2,100
Cuba	55	117,789	180	181,161	123,098	141,928	8	14,197
Danish West Indies .....	.....	.....	2	2,088	951	1,151	.....	.....
Dutch West Indies	1	1,991	2	1,250	397	1,427	2	704
French West Indies	7	11,854	13	13,860	5,128	6,712	1	222
Haiti	2	1,006	14	12,633	7,293	11,089	.....	.....
Dominican Republic	8	6,341	53	52,493	11,133	36,465	9	9,415
Argentina	24	24,966	187	225,073	357,915	210,527	7	11,917
Bolivia	6	7,876	5	2,415	1,667	1,862	.....	.....
Brazil	22	25,766	562	371,103	83,703	94,196	2	3,500
Chile	5	19,263	3	4,741	38,611	44,089	36	29,730
Colombia	3	7,611	30	32,022	4,120	7,911	.....	.....
Ecuador	1	1,425	15	15,811	1,361	4,660	.....	.....
British Guiana .....	.....	.....	2	1,840	612	2,495	.....	.....
Dutch Guiana	1	506	.....	.....	880	514	.....	.....
French Guiana	2	1,007	2	967	36	.....	.....	.....
Paraguay .....	.....	.....	.....	.....	401	.....	.....	.....
Peru	26	33,669	63	36,984	9,625	16,686	82	66,426
Uruguay	4	8,380	72	118,551	36,559	117,866	1	17,600
Venezuela	7	4,277	42	32,930	7,300	13,882	.....	.....
China	36	68,305	24	113,543	13,440	11,155	2	1,600
Japanese China .....	.....	.....	.....	.....	15	.....	.....	.....
Chosen .....	.....	.....	3	2,669	18,339	.....	.....	.....
British India	27	52,604	206	239,482	28,022	30,948	14	14,184
Straits Settlements	25	46,165	77	80,532	7,978	95,298	9	8,640
Other British East Indies ..	2	3,275	7	8,625	1,216	1,957	.....	.....
Dutch East Indies	15	30,158	214	268,363	27,808	54,656	20	25,550
French East Indies .....	.....	.....	.....	.....	318	.....	.....	.....
Hongkong	1	1,500	17	27,498	2,253	2,093	.....	.....
Japan	26	39,875	282	204,252	47,271	64,426	9	14,307
Persia .....	.....	.....	2	1,150	.....	167	.....	.....
Russia in Asia .....	.....	.....	11	24,200	.....	600	.....	.....
Siam .....	.....	.....	3	3,300	2,131	1,055	.....	.....
Turkey in Asia .....	.....	.....	.....	.....	150	.....	.....	.....
Australia	28	33,082	311	341,177	80,764	31,607	55	71,907
New Zealand	16	31,399	287	323,265	33,850	110,662	10	11,774
Other British Oceania	2	2,050	2	1,779	1,949	256	.....	.....
French Oceania	1	600	3	1,800	577	967	.....	.....
German Oceania .....	.....	.....	.....	.....	689	1,794	.....	.....
Philippine Islands	55	103,194	159	289,635	15,729	86,089	74	54,276
Belgian Congo .....	.....	.....	.....	.....	7,036	.....	.....	.....
British West Africa	12	8,540	11	13,195	17,980	5,070	.....	.....
British South Africa	5	15,001	368	429,409	56,260	53,783	23	13,569
British East Africa .....	.....	.....	8	7,126	8,553	585	.....	.....
Canary Islands	5	4,312	.....	.....	289	.....	.....	.....
French Africa	6	3,023	23	14,742	1,133	239	9	8,505
German Africa .....	.....	.....	1	761	492	.....	.....	.....
Morocco .....	.....	.....	16	20,391	1,188	.....	.....	.....
Portuguese Africa	2	1,008	1	483	160	.....	1	5,070
Egypt .....	.....	.....	10	11,790	600	6,590	9	5,052
Total	1,250	2,537,812	6,283	6,855,277	3,193,431	2,351,064	1,655	1,554,193
Totals for preceding month, July, 1919	905	2,173,303	4,679	4,975,446	2,776,150	1,570,017	1,022	837,954

Shipments to Non-Contiguous Territories

Alaska	3	3,339	7	7,082	4,774	.....
Hawaii	29	57,969	108	105,652	20,100	80,186
Porto Rico	2	5,543	60	67,491	21,096	87,704

Steam tractors numbering 65, valued at \$52,175, were exported to seven countries.

GEAR MAKERS ATTEND BOSTON CONVENTION

Cost Accounting and Standardization Are Discussed— Many New Members

BOSTON, Oct. 14—The third semi-annual convention of the American Gear Manufacturers' Association, which opened at the Copley Plaza here yesterday morning, was the best attended meeting ever held by the organization. The heavy attendance is largely due to the growth in membership, for the A. G. M. A. is a fast-growing body. As was brought out by the report of the membership committee submitted yesterday, the association then counted 69 member companies with 130 individual members. Today three more companies were elected to membership and nine new individual members were admitted, bringing the member companies up to 72 and the individual members to 139.

The meeting yesterday morning was opened by President Sinram.

Mayor Peters, of Boston, had been scheduled to deliver an address of welcome, but was prevented from being present. His place was taken by Walter L. Collins, president of the Board of Aldermen, who referred to Boston's richness in tradition and let it be known that she was aspiring to greater industrial wealth. Frank Burgess, a well-known gear manufacturer, responded for the local members. Naturally, the arrangement for the meeting lay very much in the hands of the Boston members. These were excellently carried out, and the meeting has been both a profitable and an enjoyable affair.

Active Half Year

Reports made by the secretary and treasurer showed that the association had an active half-year behind it and that its finances are in flourishing condition. Following is a list of the new members elected: A. A. Alles, Jr., Fawcus Machine Co.; Eliot A. Kebler, Fawcus Machine Co.; Robert Cromwell, Grant Gear Co.; George Proctor, Grant Gear Co.; W. F. Simons, General Electric Co.; Walter S. Giele, Lebanon Gear & Machine Works; David D. Sternberg, American Die & Tool Co.; S. L. Nicholson, Westinghouse Electric & Mfg. Co., and C. A. Arnold, Warren Machine Product Co.

Yesterday afternoon two meetings ran simultaneously, but as one dealt with a commercial and the other with a mechanical subject, they did not interfere. One of the meetings concerned the subject of uniform cost accounting and was in charge of J. H. Dunn, chairman of a committee on cost accounting. A. A. Alles, jr., of the Fawcus Machine Co., read a paper on jobs on the basis of the direct labor cost of the process hours expended on the job. Some of the gear makers present seemed to think that the system of cost accounting advocated by Denham was too elaborate and too expensive for small and moderate sized shops, but the speaker's

reply was that any system of cost accounting intelligently applied always paid for itself many times over. He said that successful department stores would make a record of the sale of a package of pins which, until recently, at least sold for 1 cent, whereas, in the cost engineering system advocated by him, the smallest time unit was 6 min. or 0.1 hr., which at present rates of wage amounts to about 10 cents. Chairman Dunn said that a large amount of data had been gathered on cost systems in use by member companies and in other lines of industry, and that in another six months he hoped to be able to evolve a definite system for submission to the association.

Simultaneously with the meeting of the cost accounting committee, there was a meeting of the standardization committee under the chairmanship of B. F. Waterman, who outlined to the chairmen and members of subcommittees the lines to be followed in evolving and acting on standards and recommended practices.

This forenoon a paper on Hindley worm gears was read by H. Fleckenstein, of the Hindley Gear Co. of Philadelphia, and was followed by a brief discussion. At noon the assembly had lunch in a body and after lunch an address on the labor problem was made by Rodger W. Babson, of Wellesley Hills, Mass. During the afternoon the delegates to the convention enjoyed an automobile tour of Boston and its environs.

PLOWMAN TRACTOR ORGANIZED

WATERLOO, IA., Oct. 11—The Plowman Tractor Co. has been incorporated here to manufacture tractors and other farm equipment. The capital stock under the reorganization is \$750,000 and the incorporators are L. C. Stearns, George W. Van Brunt, L. C. Paulsen, A. G. Ristle and A. E. Brown.

TRAILER CO. STOCK INCREASES

CLEVELAND, O., Oct. 10—Papers have been filed with the Secretary of State increasing the authorized capital of the Ohio Trailer Co. from \$300,000 to \$1,000,000.

Spokane Dealers Keen For Automobile Show

SPOKANE, WASH., Oct. 10—Every branch of the automotive industry in Spokane was represented at the meeting here last night to boost the second automobile show, Jan. 21-25.

Mayor C. M. Fassett opened the meeting. William K. Schissler spoke on "Why the Automobile Dealer Should Avoid the Moving Stairway Method of Doing Business." President Twichell announced the establishment of an employment bureau in connection with the association.

The following officers were elected: Harry Twichell, president, re-elected; E. C. Finley, vice-president; R. F. Blackwell, treasurer; C. P. Brewer, secretary, and H. J. Bensinger, P. J. Brennan, R. A. Flynn, Myron Culp and S. A. Mitchell, trustees.

New Zealand Needs

New Money Exchange

WASHINGTON, Oct. 10—New Zealand trade with America is not progressing as it would if there were a better system of money exchange between the two countries, a recent Commerce report states. Merchants who import large quantities of American manufactures are constantly anxious in regard to this exchange, as they never know whether the goods they purchase in the United States in the end will cost 6 or 8 per cent more than the original calculation. The report suggests that the best procedure for promoting trade with this Dominion would be to establish a branch American bank.

BUYS BIG LUMBER SUPPLY

TOLEDO, O., Oct. 10—The Willys-Overland Co. this week took over the hardwood lumber supply of W. T. Hubbard, approximating 8,000,000 ft., for use in the manufacture of automobile car bodies. An output of sedan and coupe bodies double that of any previous month will be turned out by the company during October, according to information at the automobile plant.

Germany's Newest Airplane



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This is the latest model of German airplane. It is designed to carry six passengers, and the construction is entirely of metal. Engineering details have not been given out. The cabin is large enough to accommodate six passengers in easy chairs

AVIATION BOARD DEFINES DUTIES

Benefits of Its Scientific Research to Be Available For the Trade

WASHINGTON, Oct. 10—Dr. Charles D. Walcott was elected chairman and Dr. S. W. Stratton secretary of the National Advisory Committee for Aeronautics at a meeting held here yesterday. The members elected to the Executive Committee include: Dr. Joseph S. Ames, Col. Thurman H. Bane, U. S. A., Capt. Thomas T. Craven, U. S. N., Dr. John F. Hayford, Prof. Charles F. Marvin, Maj. Gen. Charles T. Menoher, U. S. A., Dr. S. W. Stratton, Rear Admiral D. W. Taylor, U. S. N., Dr. Charles D. Walcott.

Prof. George W. Lewis was appointed executive officer of the committee. Estimates for the fiscal year 1921 amounting to \$437,000 were approved. In addition to the general functions of the National Advisory Committee, additional duties were defined as follows:

"Under the law the committee holds itself at the service of any department or agency of the government interested in aeronautics, for the furnishing of information or assistance in regard to scientific or technical matters relating to aeronautics and, in particular, for the investigation and study of problems in this field with a view to their practical solution.

"The committee may also exercise its functions for any individual, firm, association or corporation within the United States, provided that such individual, firm, association or corporation defray the actual cost involved.

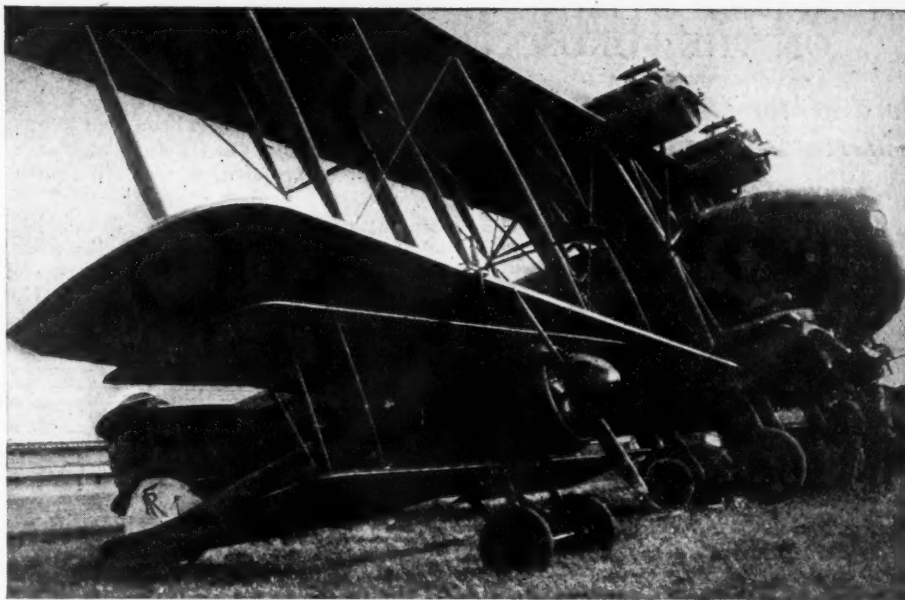
"The committee institutes research, investigation and study of problems which, in the judgment of its members or of the members of its various subcommittees, are needful and timely for the advance of the science and art of aeronautics in its various branches.

"The committee endeavors to keep itself advised of the progress made in research and experimental work in aeronautics in all parts of the world, particularly in England, France and Italy, and will extend its efforts to the securing of information from Germany and Austria.

Information to All

"The information thus gathered is brought to the attention of the various subcommittees for consideration in connection with the preparation of programs for research and experimental work in this country. This information is also made available promptly to the military and naval air services and other branches of the government, university laboratories, and aircraft manufacturers interested in the study of specific problems.

"The committee holds itself at the service of the President, the Congress and the executive departments of the Gov-



This Bleriot Aero Bus has 1000 horsepower and carried 26 passengers. Under the wing of the giant is placed a French scout plane that saw service during the war. This is for comparison purposes. The photograph shows the location of the four engines, but it cannot show the strong structure of the cabin, which is a feature of this plane

ernment for the consideration of special problems which may be referred to it, such as rules for international air navigation, method of regulation and development of civil aerial transport, technical development policies of the military, naval and postal air service, etc."

CAR MECHANICS FORM UNION

PORTLAND, ORE., Oct. 3—The automobile mechanics' examination law, passed by the last Oregon legislature, which created a state board of automotive mechanics examiners and provided that any mechanic working for hire on an automobile or truck must first have passed an examination and received a certificate to that effect, is having one effect not foreseen when it was before the legislature.

This is the formation of an automobile mechanics' union, which has presented to members of the Dealers' Motor Car Association of Oregon an agreement including the closed shop, wage scale, 44-hour week, with half holiday Saturday and no Sunday work under any circumstances, and division of all automobile mechanics into four classes. These classifications, incidentally, do not coincide with those made by the state board of automobile mechanics' examiners.

The law requires an examination fee of \$5 from each mechanic. While many dealers regard this as merely a pretext for the formation of the union and its accompanying demands, the mechanics are objecting to this \$5 fee. Injunction proceedings against the law, instituted recently by a mechanic, are now in the courts. The real cause for objection appears to be somewhat deeper than the \$5 fee, and to be aimed at examinations

principally, for up to the time of the staying of the law by temporary injunction, the examinations had put many men who had been "getting by" as mechanics in the classification of helpers.

David M. Ellis, business agent for the new union, claims 700 members for it. In substance, the agreement presented by the union to the Dealers' Motor Car Association provides that eight hours shall constitute a day's work, except on Saturday, when work will stop at noon, overtime to be paid at time and one-half for the first two hours and double time after that, except on Saturday, when overtime shall be paid at double time; double time to be paid on all holidays and no work is to be done on Sunday or Labor day.

The scale of wages does not differ greatly from wages now generally paid, some shops even paying about the proposed scale, which is: Machinists, \$1 per hour; journeymen mechanics, 87½ cents an hour; mechanics, 75 cents an hour; helpers, 50 cents an hour. The association has not yet taken action.

Big Airplane Station Planned for Buffalo

BUFFALO, Oct. 14—The fifteen acre plot recently purchased here by E. H. Baker, president of the Automobile Dealers' Association, the Karge-Baker Corp., and the Cole Motor Car Co., for the Karge-Baker Corp., may become a parking place and service station for commercial airplanes.

The Karge-Baker Corp. intended to use the plot for the erection of a large factory to manufacture flexible steel coupling, but Baker says now that the industry may not be brought to Buffalo in view of the probable use of the plot for airplanes.

CHANGE SALE PLAN ON THE FORDSON

Ford Motor Car and Tractor Interests to Combine Aug. 1, 1920—Distributors Are Eliminated

CHICAGO, Oct. 10—The Fordson tractor distributors are slated to go. The Fordson tractor and Ford motor car selling interests will be combined by Aug. 1, 1920.

This is the most radical change in selling policy any company in the tractor business ever has taken. It means the elimination of the men who are primarily responsible for putting the Fordson tractor on the map, following its quantity production, and the announcement of the state distribution plan made by Henry Ford about a year and a half ago. During the last 18 months, under the dominance of the Fordson distributors, something like 75,000 Fordson tractors have been put onto the farms of the country, and by the time the distributors' organization relinquishes control, 10 months hence, this number likely will be about doubled.

In announcing the change in selling policy, the company gave no reasons. It asserts, however, that all of its present distributors are working in harmony with the company to make the change effective.

When Henry Ford & Son began the distribution of the Fordson tractor by states in March, 1918, the country was practically covered by distributors within a comparatively short time. For the most positions were prominent Ford car dealers in their respective cities, although there were two or three instances of men from other automobile organizations being given a chance. One of these exceptions was Watson, of Wichita, Kas. Herring, of Des Moines, Ia., was perhaps the most favored of all, since he was given control of the three states of Iowa, Nebraska and South Dakota. Other men like Schmelzel, of St. Paul, Minn., and Meiklejohn, of Fond du Lac, Wis., were given entire states. In other instances, as in Illinois, the state was divided between several distributors. But whatever or wherever the territory, the distributor was the big factor in Fordson distribution, and to all appearances the organization was committed to the distributor plan.

The new policy eliminates the distributor entirely and will result in the Fordson being sold on the direct to the dealer plan. The combination of the Fordson and Ford car selling interests indicates an intention, in all probability, to utilize the numerous Ford plants throughout the country as distributing points for the tractor. Whether there will be concentrated at these points also the line of tractor implements sold with the tractor is unknown at present.

Whether the company has special

reasons for making this change, or whether it is just another incident in the general tendency apparent in the tractor business toward the elimination of the distributor, no one seems willing to say at this time. But it has been well known for some time that the tractor distributor, as a general proposition, was slipping in favor of the branch house plan of organization. A number of the better known tractor companies have done away with nearly all of their distributors and have substituted the branch house. Now that Ford has done the same thing, whatever his reasons may be, the tendency will be strengthened.

Brisk Business Now In the Jobbing Trade

NEW YORK, Oct. 15—Merchandise movements in the jobbing trade are today greater than they ever have been, according to Fred W. Kohl, of the Zinke Co., Chicago, who has completed his nineteenth trip to the Pacific coast. The Zinke Co. is the sales department for a number of factories.

Kohl left Chicago July 3, returned there Oct. 4 and is now making a trip through the East. He says that business all along the route is about 33 1/3 per cent greater than what it was last year. Conditions are exceptionally good on the Coast. There is a strong demand for staple products which are required in car upkeep, and he considers this a good barometer of business conditions. Merchandise production, he finds, is from 30 days to two months behind, as a general rule, with all factories. The industry would be benefited, he suggests, if jobbers would place orders in the fall for January and March shipments so that the factories could continue to operate their maximum capacity during November and December.

GUARDS AGAINST FRAUD

WASHINGTON, Oct. 14—An amendment has been suggested by the Federal Trade Commission of the House Judiciary Committee which would force every firm or concern offering stocks or bonds for sale to the public to publish the names of the promoters and the underwriters, the rate of commissions or bonuses received by the promoters or underwriters and the net amount received from the sale by the corporation, on the front page of all its circulars and literature. The commission states that this amendment would effectually prevent the fraudulent sale of stocks.

WOULD TAX MAGNESITE

WASHINGTON, Oct. 7—An import tax of one-half cent per pound on magnesite ore crushed or ground and three-quarters of a cent per pound on magnesite calcined and grain would be levied if a bill now before Congress is passed. Magnesite brick would be taxed three-quarters of a cent per pound. These duties would only be applied upon magnesite imported into the United States from foreign countries.

CALIFORNIA SHOWS MOTOR TRUCK NEED

Farmers and Merchants Witness Advantages of Automotive Transportation In 1,000-Mile Trip

SAN FRANCISCO, Oct. 10—The first California motor truck train, demonstrating to farmers and small town merchants the need for automotive transportation, ended its 1,000 mile trip over California highways here yesterday.

The trucks followed the valley route to Los Angeles and returned over the coast highway. The train left this city on Sept. 25, arriving at Los Angeles Oct. 4. The return trip was a non-stop run to ascertain the actual time consumption in transporting merchandise straight through from Los Angeles. The only stops were for fuel and meals. The actual running time was 51 hours, which, in comparison with freight shipment by rail, made an approximate saving of nine days. In addition to the saving in time, there was a saving in the usual heavy cost allowances for breakage in handling. Rail shipments involve six to eight handlings and truck shipments only two.

At night controls, mass meetings were held in city squares, which included the showing of motion pictures of the recent trans-continental government convoy trip, and the manner in which ship by truck is working out in the eastern sections of the country.

The trip was arranged and carried out under the auspices of the San Francisco Firestone Ship by Truck bureau, and the following California truck distributors: Butler Veitch Co., Fageol; William L. Hughson Co., Federal; Garford Motor Truck Co., Garford; International Harvester Co., International; International Mack Co., Mack; Pacific Nash Motor Co., Nash; Earl C. Anthony, Packard; Western Motor Co., Kissel and Maxwell; The White Co., White, and the Peacock Motor Sales Co. service.

Train Commander Blickinger reported that all of the trucks participating show little effects of the long drive, and, except a few minor difficulties, no delays were encountered on the entire trip.

MILLER RUBBER INCREASE

AKRON, O., Oct. 10—The Miller Rubber Co. reports a 56 per cent increase in sales volume during the first seven months of 1919, as compared with the same period in 1918. This company did a \$16,600,000 business in 1918. A \$23,000,000 figure was set for 1919, and from present indications the latter mark will be passed easily, officials declare.

PLANS LARGER FACTORY

PONTIAC, MICH., Oct. 10—The Pontiac Body Co. will spend \$250,000 in plant extensions in 1920 to care for a heavy production increase. The company has received a large body contract from the Oakland Motor Car Co.

ENGINEERS DISCUSS MULTIPLE DRIVE

Henry C. McBair Reads Interesting Papers Before the S. A. E.

NEW YORK, Oct. 10—Henry C. McBair, of Middletown, N. Y., read a paper on "Gear Transmissions" last night at the first monthly meeting of the metropolitan section of the Society of Automotive Engineers. The title of the paper was somewhat indefinite, the subject really covered by the paper being that of multiple direct drives. McBair is the inventor of a transmission axle by which all three forward speeds can be obtained each by a single gear reduction to the rear axle.

Geared 7½ to 1

The author traced the development of multiple direct drives from the time of the Sozaire-Naudin car, which made its appearance in France in 1905, up to the time of the outbreak of the war, illustrating and describing about a dozen different constructions. The greatest problem of such a drive is, of course, that of obtaining a sufficiently great gear reduction on low gear without reducing the ground clearance too much. McBair said that a low gear reduction of from 1 in 6 to 1 in 12 could be obtained with this type of construction. He has an old Stoddard-Dayton car, which he has fitted with a transmission of his design, in which the low gear reduction is 7½ to 1, and this, he claims, gives the car all the reserve power required for difficult situations.

It was brought out in the discussion that the chief reason for the failure of some of the earlier two-speed axles was that they were too heavy. The author claimed that his two-speed axle was no heavier than present standard single-speed axles, and that it had the same ground clearance. Another reason for the failure of the multiple-speed axle in practice was believed to be the involved patent situation. It was said that there was a great deal of overlapping of patents in this field. As regards the ground clearance obtainable, the development of the helical bevel gear will permit this to be increased, as with a helical bevel gear it is practical to use a pinion of a smaller number of teeth than with a straight bevel gear.

On Splined Hub

In the McBair axle the ring gears slide on the splined hub of the differential gear, being moved laterally by means of a cam ring backed up by a ball thrust bearing. In this way the particular gear which it is desired to engage is moved into mesh with its pinion.

There was considerable discussion as to the possibility of enmeshing the teeth of the gears in this way, but Mr. McBair claimed that it was possible, while going ahead at full speed, to throw the reverse without damaging the teeth. The in-

crease in the upspring weight was named as one of the objections to multiple direct-drive axles, and in this connection the point was made that one pound of unsprung weight was equivalent to 20 lb. of sprung weight.

A resolution was adopted calling for the appointment of a committee to arrange for a joint meeting with the Philadelphia Section during the coming winter.

Transatlantic Air Route Is Planned

WASHINGTON, Oct. 10—The Northern Aerial Syndicate of Great Britain is arranging a passenger airship service to this country, according to reports from Trade Commissioner Henry F. Grady. The plans are for airships carrying 150 passengers in addition to cooks, stewards and crews, to serve the westward and eastward passengers between England and New York. Plans are also arranged for service to Perth, Australia, this journey to be made in seven days. Passengers from America will be deposited at Liverpool, transferred to smaller aircraft and taken to their destinations.

SEWELL OPENS BRANCHES

DETROIT, Oct. 13—Branches in Dallas, Omaha, Salt Lake City, Los Angeles, San Francisco, Portland, Seattle and Porto Rico have been opened recently by the Sewell Cushion Wheel Co. The present demand for Sewell wheels is far in excess of all production efforts. The concern has thirty-five distributing branches.

WILL BUILD A NEW TRUCK

GREENVILLE, MICH., Oct. 10—The Tower Motor Truck Co. on Dec. 1 will bring out a new truck. It will have a capacity of 1½ tons and will be equipped with pneumatic cord tires.

Janesville Firms Are Consolidated

JANESVILLE, WIS., Oct. 13—The final step in the consolidation of the Janesville Machine Co. with the Samson Tractor Co. was effected during the week, when the executive departments of the two concerns were merged in the new general office building of the Samson works at Janesville. When General Motors determined to locate its main tractor plant in Janesville it acquired the Janesville Machine Co., manufacturer of farm machinery, to serve as a source of supply of units for combination with tractors.

J. A. Craig, president of the farm machinery concern, was made president and general manager of the Samson organization. Under the consolidation W. L. Clark becomes general sales manager; H. M. Craig is named sales manager of the tractor and implement division; C. C. Clay, formerly manager of the Chevrolet branch at Atlanta, Ga., is appointed sales manager of the truck and passenger car division; John W. Miller becomes manager of the parts and service department for the truck, passenger car and tractor divisions.

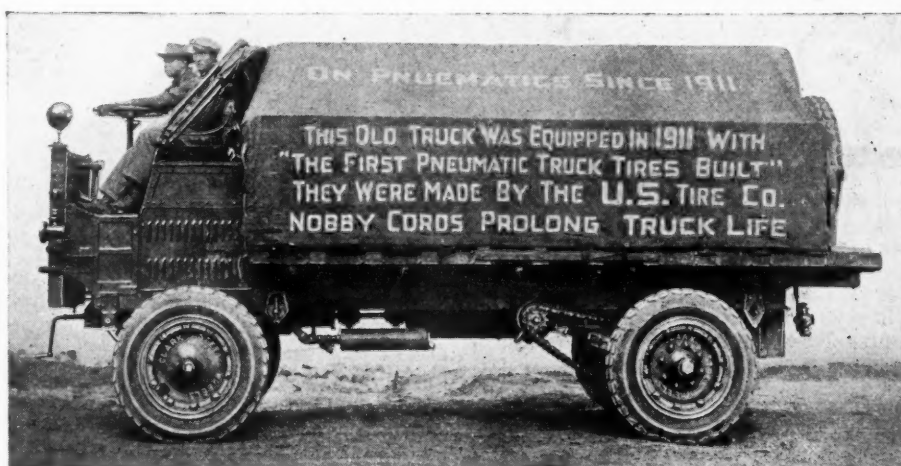
The Janesville Machine Co. was founded in 1859 and was incorporated in 1883. While it will not lose its identity entirely, it now operates under the direction of the Samson Tractor organization.

APOLLO MAGNETO TO MOVE

BROOKLYN, Oct. 11—The Apollo Magneto Co., 1723 Eighth Avenue, has purchased the plant of the Campbell Motors Co., Kingston, N. Y., and is planning to move its Brooklyn factory to that place.

BEAVER TRUCK CO. FORMED

HAMILTON, ONT., Oct. 11—The Beaver Motor Truck Co., capitalized at \$350,000, has decided to locate here. A light two-ton truck will be turned out.



PNEUMATICS GIVE LONG LIFE TO TRUCK

The truck shown above is making a 5,000-mile tour of this country as an object lesson of the value of equipping such vehicles with pneumatic tires. The United States Tire Co., promoters of the tour, claim that this truck was the first one in this country to be equipped with such tires, as it was fitted with pneumatics at the Detroit branch of the company in 1911. The truck was said to be in good condition, having, probably, several more years of life

JOINS MOTOR CORPS

WASHINGTON, Oct. 8—W. T. Norton, Jr., has been appointed assistant chief of the engineering branch of the Motor Transport Corps and will have charge of the research work now under way on the German war trucks at the Bureau of Standards. Norton, who was formerly chief engineer for the Selden company, was on the committee sent to France by the Motor Transport Corps early in 1918, in a civilian capacity, to investigate the operation of war vehicles.

U. S. NEEDS INSTRUCTORS

WASHINGTON, D. C., Oct. 11—The Civil Service Commission is receiving applications to fill 150 positions of assistant instructors in the motor transport training school. The entrance salaries range from \$1,800 to \$2,400 a year.

B. J. Kough, manager of the Marseilles plant of the John Deere Plow & Tractor Co., has been appointed manager of the main plant at Moline, Ill., to succeed H. B. Dinneen, who resigned to become assistant to R. W. Lea, vice-president.

Jay Dewey, formerly district sales manager for the Lexington Motor Co., Connersville, Ind., has been appointed director of sales for the Lexington Minute-Man Six.

R. M. Tarr has come from Cape Colony, South Africa, to study American power farming methods. He will make his headquarters for the winter at Moline, Ill., and will take the short course in the mechanism of tractors and other power farming implements in the shops of the Moline Plow & Tractor Co.

Ralph E. Allen is announced as general manager of the Duratex Co., Newark, N. J., manufacturer of Duratex upholstery material for automobiles and trucks.

Earl W. McGockin has been appointed sales manager of the automotive division of the newly opened Detroit office of the Duratex Co., of Newark, N. J., manufacturer of coated fabrics.

Parcel Post Rates**For East Indies Set**

WASHINGTON, Oct. 15—Postmasters have been informed that the principal islands that may be reached through the parcel post service from the United States to the Netherlands East Indies are Bali, Banka, Villiton, Dutch Borneo, Celebes, Java, Little Soenda (Sunda), Madura, Moluccas (Molukken), Rhio (Riouw), Sumatra, Dutch Timor and Dutch New Guinea. This is in accordance with regulations pertaining to parcel post shipments just issued by the Post Office Department, states a commerce report.

The Jamaica postal administration has given notice that parcel post packages are frequently received from the United States with incorrect declarations of the contents, request being made that the customs declarations attached to parcels in future be more carefully prepared and more correctly describe the contents of the individual packages.

Each parcel must have its own customs

Men of the Industry *Changes in Personnel and Position*

BRAZIL REPRESENTED

NEW YORK, Oct. 10—The American Chamber of Commerce for Brazil has announced the appointment of Leslie E. Freeman as resident representative of the chamber in the United States.

The growing interest of American manufacturers, exporters and importers in Brazil has shown the necessity for the chamber to be represented in New York so that its advantages may be more available and its interests properly promoted.

Walter S. Gaines, Jr., formerly of the Cleveland Tractor Co., has associated himself with the Mobile Tractor Co., Mobile, Ala., in the capacity of chief engineer.

Robert C. Crowthers, former Cincinnati automobile dealer but who for three years has been manager of the automobile department of the Cincinnati Commercial Tribune, has been appointed advertising manager of the Gary Motor Truck Co., of Gary, Ind.

N. A. Root, manufacturers' agent, Oakland, Cal., has opened an office at 230 Broadway and plans to accept exclusive agencies for that district.

Albert de Maringh, formerly manager of the Detroit office of the U. S. Ball Bearing Co., has returned to Chicago in the capacity of general sales manager of the Rex Machine Co., manufacturer of valveless power-driven tire pumps, die testing presses and valveless service station equipment.

declaration attached, describing the contents and giving the value for that individual package, and no package will be accepted without an attached customs declaration properly filled out.

Civilian Flying Over U. S. Forts Is Barred

WASHINGTON, Oct. 10—Civilian flyers are prohibited in the future from operating aircraft over "the vicinity of fortified areas within the boundaries of the United States, including the Panama Canal Zone," according to instructions issued today by the War Department.

BRITISH BAN RAISED

WASHINGTON, Oct. 10—The ban on shipments to United Kingdom ports placed upon United States Shipping Board vessels, due to the railroad strike in England, has been partly lifted, according to announcement made by the United States Shipping Board in a commerce report.

COOK RETURNS FROM EUROPE

WABASH, IND., Oct. 14—Sam J. Cook, export manager of the Service Motor Truck Co., has returned from an extended business trip, covering the countries of continental Europe, the British Isles and Scandinavia. Cook was appointed to the United States Liquidation Commission and sailed from America early in March, it being the duty of this commission to adjust all inter-allied and associated powers' claims against the United States and vice versa.

After accomplishing his work with this commission he received special permission to make a trip in the interests of the Service Motor Truck Co. for the purpose of visiting the foreign distributors of Service motor trucks and for the preparation of a commercial survey.

He reports that the opportunity for American business is wonderful, with certain exceptions, where heavy import duties and exchange are operating against this country.

He believes that Germany will come back rapidly and be a big factor then—from a competitive standpoint to the American manufacturers. The Germans are working hard, and the way to meet the competition is through increased work and increased production, he said.

H. W. Ross was recently elected vice-president of Templeton, Kenly & Co., Ltd., Chicago, manufacturers of Simplex jacks, assuming his duties with that company Sept. 29.

FINLANDER SEEKS PARTS

NEW YORK, Oct. 15—Erik Heinonen of Skolgatan, Abo, Finland, has written to Automotive Industries that he is interested in the organization, at that address, of a company to build motor cars, chiefly trucks of 3 and 3½ tons' capacity and touring cars of about 30-40 hp. He adds that he would be interested to get into communication with manufacturers of component parts.

Car Increase Shows**Texas Prosperous**

AUSTIN, TEX., Oct. 10—The Texas highway department has registered 303,648 motor vehicles from Jan. 1 to Sept. 17, 1919. The total registration for 1918 was 251,118. These figures include passenger cars and trucks.

The increase can be attributed to some extent to the oil developments, as well as to better business conditions and the great amount of good road construction that has been undertaken by the counties.

MOTOR TRANSIT CO. FORMED

GRAND RAPIDS, Oct. 10—The Western Michigan Motor Transit Co. has completed organization with an increase in the capital stock from \$100,000 to \$300,000, and plans have been formulated for opening the line to Fremont, Hesperia, Muskegon, Grand Haven and Hastings and intermediate points. The route will be extended later. F. S. Piowaty is president and C. T. Hedges traffic manager.

Cole Motor Co. Plant Will Double Output

INDIANAPOLIS, IND., Oct. 10—The Cole Motor Car Co. has started a program of enlargement that will double the present output early in 1920. The expansion program includes the erection of a four-and-one-half-story structure of brick and steel on a recently acquired track north of the present Cole factory site. It provides more than 150,000 sq. ft. of factory space in addition to railroad yards and loading platforms.

An east wing also is contemplated which will adjoin the main factory and furnish 110,000 sq. ft. more of floor space.

During 1919 the Cole company is assured of a production minimum of 6,500 Aero-Eight cars. In 1920 the production has been set for 12,000.

Splitex Co. Acquires Sheet Metal Works

RACINE, WIS., Oct. 13—The Splitex Radiator Co. of Racine, Wis., which some time ago established a plant in the former main works of the Secor Trunk Co., has acquired the business and equipment of the M. Jenson Co., sheet metal works at Racine, and is consolidating the operation with its own. The Splitex company manufactures radiators for motor cars, trucks and tractors. Members of the Jenson Co. take positions with the Splitex organization as managers of the sheet metal department.

Quarter Million Tire Plant for Cleveland

CLEVELAND, Oct. 14—The Ultimate Tire & Rubber Co., capitalized at \$2,000,000, will establish its plant in this city. The first unit will cost \$250,000. R. J. Birch, president of the new concern, has taken a 99-year lease on a manufacturing site, with an option to purchase by July, 1929, at \$120,000.

METAL SPECIALTIES COMPANY

MILWAUKEE, WIS., Oct. 11—The Wisconsin Machine Products Co. has been incorporated with a capital stock of \$10,000 by Jay J. VanVechten and Robert A. Radwick. It will manufacture automotive machine products and other specialties.

PRUDEN WHEEL CO. SOLD

LANSING, MICH., Oct. 14—The Prudden Wheel Co. has bought the plants of the Weis & Lesh Mfg. Co. at Memphis and Jackson, Tenn. The Weis & Lesh company is a pioneer spoke manufacturing concern. The operating organization of the Weis & Lesh company will not be changed.

MASON TIRE ENLARGING PLANT

KENT, O., Oct. 13—The Mason Tire & Rubber Co. has begun building extensive additions to its plant, including factory, general offices and garage units. The company recently increased its capital stock to \$7,500,000.

Current News of Factories

Notes of New Plants —Old Ones Enlarged

\$1,500,000 Extensions For Aluminum Mfg. Co.

MANITOWOC, WIS., Oct. 13—A complete rolling mill unit is being added to the main works of the Aluminum Goods Mfg. Co. at Manitowoc, Wis. It will be one and two stories high, 300x400 feet in size, and cost \$500,000 or more. A general manufacturing addition to the Manitowoc plant is nearing completion. The branch factory at Two Rivers, Wis., is also being enlarged. The total cost of this year's new construction and equipment will run beyond \$1,500,000. The eastern factory at Newark, N. J., was built three years ago at a cost of \$500,000.

PISTON MAKER EXPANDS

HOWELL, MICH., Oct. 10—The Spencer-Smith Machine Co., manufacturer of pistons, announced an increase in capital from \$100,000 to \$200,000 to care for increased business. The company specializes in a light-weight semi-steel piston and is at present filling contracts with the Mitchell Motors Co., the Continental Motors Corp., the Chandler Motor Car Co., Briscoe Motor Corp., Allen Motor Co., Oakland Motor Car Co., Wisconsin Motor Manufacturing Co., Mills Tractor Co. and others.

JAXON STEEL EXPANDS

JACKSON, MICH., Oct. 11—The Jaxon Steel Products division of the General Motors Corp. will double the size of the addition now being built to its present plant. The building program for the present year calls for a \$60,000 addition, but fearing that this added floor space would not sufficiently relieve the demands for greater output, the company has applied for a building permit calling for a new \$70,000 addition to this structure.

FEDERAL ENLARGES PLANT

MILWAUKEE, WIS., Oct. 14—The Federal Rubber Co., of Illinois, manufacturer of Federal tires, is enlarging its main factories at Cudahy, a suburb of Milwaukee, by the erection of a large rubber cement storage house, two stories, 50x130 ft., and a tank vault, 25x100 ft., 17 ft. deep, containing eight 10,000-gal. steel tanks.

REPORTS LARGE SALES

AKRON, O., Oct. 11—The Miller Rubber Co. reports a 56 per cent increase in sales volume during the first seven months of 1919, as compared with the same period in 1918. This company did a \$16,600,000 business in 1918. A \$23,000,000 figure was set for 1919, and from present indications the mark will be passed easily, officials declare.

Warner Plant Taken By General Motors

MUNCIE, IND., Oct. 13—It has been announced that the General Motors Corp. has taken over the T. W. Warner Co. here and that T. A. Warner, head of the company, has joined the advisory staff of W. C. Durant, president of General Motors.

Warner authorized the statement that there will be no change in the management of the Warner company.

Two new buildings, the larger of which is 300x500 ft., now being erected on adjoining ground, will be part of the Muncie division, manufacturing chassis parts for Chevrolet and other General Motors assembling plants.

Black & Decker Mfg. Co. Erecting New Factory

BALTIMORE, MD., Oct. 13—The Black & Decker Mfg. Co. announces that work has been started on a new plant at Towson Heights. The new building will be 100 x 200 ft., and will be ready for occupancy early in December. Plans for the additions include provision for an attractive women's rest room. It is believed the output during 1920 will be doubled.

BODY MAKER IN NEW HOME

CHICAGO, Oct. 10—The Automotive Body Corp. has moved into its large new factory, 1211-1215 Clybourn Avenue. The building contains 40,000 sq. ft., occupied by modern and complete equipment.

BUILDS NEW CASTING PLANT

RACINE, WIS., Oct. 13—The Walker Mfg. Co., Racine, Wis., makers of lifting jacks and other accessories, has broken ground for a brick and steel foundry building, 80 x 120 ft., in order to do all its own casting processes.

NEW PORTAGE RUBBER PLANT

AKRON, O., Oct. 9—The Portage Rubber Co., of Barberton, O., has ordered that the regular quarterly 3 per cent dividend on common stock of the company be paid on Nov. 15 on all stock of record of Nov. 5.

The directors also ordered the immediate preparation of plans and specifications for a three-story factory addition, 80x200 ft., to be of reinforced concrete construction, at an estimated cost of approximately \$200,000.

ADOPTS U. S. METHODS

LONDON, Oct. 11—At a recent meeting of the Cubitts Engineering Co., which has started quarterly production of motor cars at an estimated price of \$1,450, it was stated that it had adopted American methods of standardization and quantity production, and at the same time that it was hoped to produce a thoroughly English car.

Orders totaling \$5,000,000 have been booked, it was announced. Of this amount \$125,000 has been received on deposit.

Calendar

SHOWS

Nov. 16-23—New York Automobile Salon, Hotel Commodore.
January—New York, International Automobile Mfrs.' Congress.
Jan. 3-10—New York, N.Y. Grand Central Palace, National Automobile Chamber of Commerce. S. A. Miles, Manager.
Jan. 3-10—New York City. Eighth Coast Artillery Armory, commercial cars and accessories.
Jan. 17-24—Cleveland. Nineteenth Annual Automobile Show, Cleveland Automobile Mfrs.' and Dealers' Assn., Wigmore Coliseum.
Jan. 24-31—Chicago, Ill. Coliseum. Cars: Drexel Pavilion. Trucks: National Automobile Chamber of Commerce. S. A. Miles, Manager.
Jan. 24-31—Chicago. International Amphitheater, commercial cars and accessories.
Jan. 31-Feb. 6—Kansas City, Mo. Annual exhibition, Overland Bldg. E. E. Peake, Manager.
Feb. 21-28—Ottawa, Ont. Motor Show.
Feb. 23-28—Louisville, Ky. Twelfth annual exhibition, Louisville Automobile Dealers' Assn., First Regiment Armory.

February—Chicago. International Automobile Mfrs.' Congress.
February—Deadwood, S. D. Annual show, Deadwood Business Club. F. R. Baldwin, Manager.

FOREIGN SHOWS

November—Christchurch, N. Z. First National Motor.
Nov. 7-16—London. Olympia Motor Car Exhibition—Society of Motor Mfrs. and Trades.
December—Brussels. International Automobile Mfrs.' Congress.
Dec. 19-Jan. 4—International Aviation Exhibition, Paris, France.
January—Glasgow. Scotland Scottish Motor Exhibition.
February—Manchester, Eng. North of England Motor Exhibition.
Feb. 23-March 6—Birmingham, Eng. British Industries Fair.
March—London, Eng. Motor Boat, Marine and Stationary Engine Exhibition.
March—Adelaide, Australia. All Australian Exhibition of motor vehicles, airplanes, engines and automotive equipment.
April or May—London, Eng. Commercial Vehicles Exhibition, Olympia.
April 3-May 4—Buenos Aires. Exposition of U. S. manufactures.

AUTOMOTIVE SHOWS AT FAIRS

Oct. 6-19—Dallas, Tex. Cars, trucks and tractors, Texas State Fair.
Oct. 20-25—Raleigh, N. C. Cars, trucks and tractors.
Oct. 22-27—Shreveport, La. Cars, trucks and tractors.
Oct. 27-31—Columbia, S. C. South Carolina State Fair Assn.
Nov. 3-8—Phoenix, Ariz. Tractor Demonstration, Arizona State Fair.

TRACTOR SHOWS

Oct. 30—Yerlington, Nev. Tractor demonstration, Lyon County Farm Bureau.
Nov. 22-29—Jacksonville, Fla. Florida State Fair and Exposition. B. K. Hanaford, Manager.
February—Kansas City, Mo. Fifth Annual Kansas City Tractor Club. Guy H. Hall, Manager.
Feb. 9-14—Wichita Kan. Tractor and Farm Machinery, Forum, Wichita Thresher-Tractor Club.

CONTESTS

Nov. 2-3—El Paso, Tex. El Paso Phoenix road race.
Nov. 27—Los Angeles, Cal. Ascot Speedway race.
Dec. 29—Los Angeles, Cal. Ascot Speedway race.
August, 1920—Paris, France. Grand Prix Race, Sporting Commission, Automobile Club of France.

CONVENTIONS

Oct. 20—Atlantic City, N. J. Convention of business men called by Chamber of Commerce of U. S. to confer with foreign delegates.
Oct. 27-28—Santa Barbara, Cal. State Automobile Trade Assn., Southern Division.
Oct. 29—Washington, D. C. Annual Labor Conference provided by Peace Treaty.
November—London, Eng. Road Transport Congress and Exhibition.
Nov. 3-8—Chicago, Ill. Convention, Automotive Equipment Assn., Medinah Temple.
Nov. 7-8—Detroit. Meeting of National Assn. of Motor Truck Sales Managers, Hotel Statler.
Nov. 10—Detroit. Service Managers' Convention.
Dec. 3-5—Cleveland. Ohio Automobile Trade Assn., annual convention.
January, 1920—Washington. Pan-American conference.
Feb. 9-13—Louisville, Ky. Seventeenth Annual Convention American Road Builders' Assn., Tenth American Good Roads Congress and Eleventh National Good Roads Show.
May 15-20, 1920—San Francisco. Seventh National Foreign Trade Convention.

Space Assignments

For Salon Are Made

NEW YORK—Space assignments at the Salon to be held at the Commodore Hotel, Nov. 17-22, were drawn for by exhibitors at the Automobile Club of America recently. The representation present indicated an exceptionally fine showing of high grade jobs.

The imported exhibits will include the Renault, the Rolls-Royce, Lancia, Sunbeam, Delage and Pic-Pic cars. The American makers include: Locomobile, Argonne, Cunningham, Daniels, Brewster, Porter, Phianne, Re-Vere, Du Pont and Meteor. Coach work will be shown by Fleetwood, Holbrook, Brooks-Ostruk, Rubay and Barker, of London. Among the accessories to be shown are products of Klaxton telephone, S. Smith & Sons speedometers, Faure tires, Dunlop tires, Laidlaw Company fabrics, Westinghouse air spring and the Rees jack.

New York Air Brake

Plans Passenger Car

NEW YORK—The New York Air Brake Co., which entered the truck manufacturing field a few weeks ago, now plans to make passenger cars, according to a recent trade report.

The first truck was completed a few weeks ago and the factory is now turning them out in small quantities. Production will be increased gradually and it is expected that the annual output will be brought up to an annual output of 20,000.

It is understood that the manufacture of passenger cars will be started immediately.

The new job will contain several patented features, it is said, that are expected to achieve immediate popularity for it.

Officials of the company have refused to make any announcement of their passenger car plans at this time.

Harry E. Stutz to

Make New Car

INDIANAPOLIS—Harry C. Stutz has re-entered the automobile industry with a moderately sized quality car, and plans to display both the finished job and the chassis in the New York and Chicago shows in January.

The new Stutz organization is a \$1,000,000 company recently incorporated in Indiana, of which Stutz is the controlling stockholder.

The officers are: Harry C. Stutz, president; Samuel T. Murdock, vice-president; Harry F. Campbell, treasurer; A. Gordon Murdock, secretary. Board of directors: Harry C. Stutz, chairman; Henry F. Campbell, Samuel T. Murdock, James G. Murdock, Henry H. Hornbrook.

ATLAS BUSINESS GROWS

LANSING, MICH., Oct. 10—The Atlas Drop Forge Co. handled \$1,000,000 worth of business during the fiscal year just closed, according to the report of the general manager at the recent stockholders' meeting. This record exceeds by \$250,000 the business handled during the preceding year. No dividends were announced at the annual meeting.

Motor Transport Corps

Exhibit for Chicago

NEW YORK—Various types of motor vehicles constructed for use by the Army during the war, and many types of motors and vehicles inspired by the needs of the European struggle are to be shown in the Motor Transport Corps exhibit at the First Regiment Armory, Chicago, Dec. 4-6.

It is planned to make the Chicago show similar in its many interesting features to the exhibition that drew thousands of spectators to the Eighth Coast Artillery Armory in New York last month.

Headquarters has been established by Major F. C. Hecox, M. T. C., at 230 East Ohio Street, Chicago.

SELL AIRPLANE LINEN

WASHINGTON, Oct. 15—The Material, Disposal and Salvage Division of the Air Service will sell 60,000 yards of airplane linen. Additional information can be secured at the District Bureaus of Aircraft production located at Buffalo, Chicago, Dayton, New York and San Francisco.

FOUNDRY CO. ENLARGED

ST. JOHNS, MICH., Oct. 14—The Industrial Foundry Co., which started here five years ago with six men and which now employs fifty-two men, will be enlarged at once. New units which will bring the valuation of the plant up to \$10,000 are proposed.